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CONTENTS

THE ARMY'S ROLE—A 1940 PERSPECTIVE ---- Lt. Gen. R. S. McLain, *USA* 3

THE ARMED FORCES OF THE PHILIPPINES ---- Lt. Col. W. L. Osborne, *Inf* 18

THE BREAKOUT AT ANZIO—A LESSON IN TANK-INFANTRY COOPERATION ---- Lt. Col. B. S. Cairns, *Cav* 23

THE ARMY EDUCATION PROGRAM ---- Col. W. E. Sewell, *GSC* 33

USE OF 'DIVISION SLICE' FACTORS ---- Lt. Col. H. R. Page, *USAF* and Lt. Col. L. J. Fuller, *CE* 40

THE OFFENSIVE AND DEFENSIVE USE OF THE CHEMICAL MORTAR BATTALION ---- Lt. Col. K. A. Cunin, *Cml C* 45

OBSERVING PERSONNEL MANAGEMENT AT WORK ---- Lt. Col. C. D. Colman, *FA* 56

MILITARY NOTES AROUND THE WORLD ---- 63

FOREIGN MILITARY DIGESTS ---- 73

The Aerial Battle ---- 73

The Projected Assault on Japan ---- 77

Resistance Movements in World War II ---- 80

Military Art as an Academic Subject ---- 85

The German Services Merger ---- 88

Soviet Employment of Armor ---- 95

Strategy of the Second Battle of France ---- 97

Defense in Atomic Warfare ---- 104

Discipline and Leadership ---- 106

The Strategic Importance of British East Africa ---- 110

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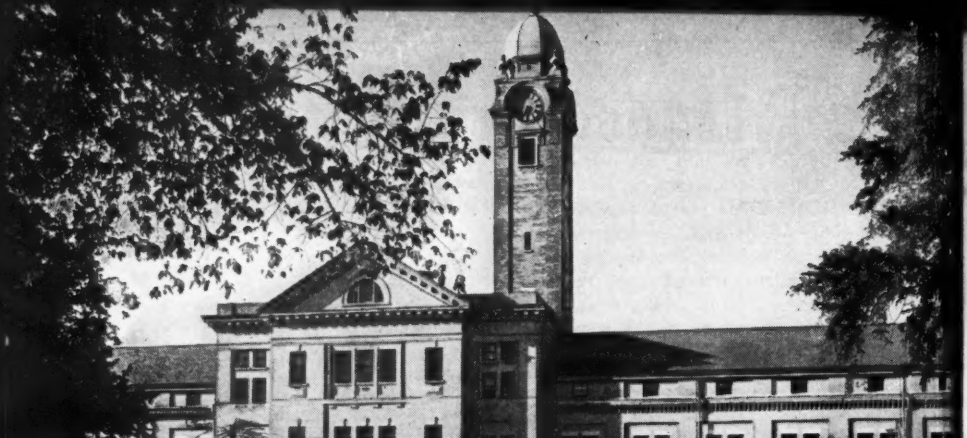

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The Army's Role
A 1949 Perspective

Lieutenant General Raymond S. McLain
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I. The Strategic Outlook

IT is my purpose to discuss the mission of the Armed Forces of the United States, especially that of the Army, and the resources available for fulfilling this mission; and, in particular, to examine the implications for the Army in the immediate future in trying to make available resources adequate to the duties which have been imposed on it and which it must perform now—every day.

The mission of the Armed Forces of the United States, as defined by Executive Order 9877, dated July 26, 1947, includes the following:

1. To support and defend the Constitution of the United States against all enemies, foreign or domestic.
2. To maintain, by timely and effective military action, the security of the United States, its possessions and areas vital to its interests.
3. To uphold and advance the national policies and interests of the United States.

The mission of the Army as defined by Executive Order 9877 and by the National Security Act of 1947 embraces all aspects relating to combat on land. In so far as preparations for land warfare are involved in fulfilling the above mission, it is the duty of the Army to see that it has reached the highest practical level of readiness. It is the duty of the leadership of the Army to keep the political leaders of the government constantly advised of requirements for land warfare and what the Army lacks to meet these requirements. These estimates must be constantly related to the current situation, as it develops from time to time.

It is the duty of the civil agencies of the government to set the foreign policy which the military policy must serve. It is the primary responsibility of Congress to see that the means of the military policy are sufficient to support the foreign policy. Lacking adequate means, the national policy becomes insolvent. Policy determination is in civil agencies' hands, but it is the duty of the military leaders to advise what means are necessary, and to warn when those means are lacking. If their advice is disregarded, it is still the duty of the Armed Forces to do their best with the means at hand to support the national policy. This is not a criticism. It is a simple application of the principles of the Constitution which the Armed Forces are enjoined to support. It is still the duty of a fire department to fight fires, whether or not they have adequate personnel, training, or the most modern equipment. My purpose is to examine *some* of the problems and related matter which the military establishment

As long as men walk on the earth, use wheeled transportation, or must return to the earth to maintain themselves, it is fundamental that land warfare will have a high priority in the conduct of war

must face in making the means provided adequate to the ends. I wish to direct this article particularly to the young officers of the Army, who may be confused as to the importance to be attached to the role of the Army in any future war, and who may feel that the spectacular role of other services may have minimized their own job. I want to assure them of the contrary, and show that the pattern of war has simply expanded the scope of operations and their role is still vital and of major importance. This necessitates no discounting of any of the other services, whose power and importance is well established.

In the historic past this task was not of urgent moment. The situation of the United States, more than a half century ago, was described by Lord Bryce in the *American Commonwealth:*

> . . . America lives in a world of her own. . . . Safe from attack, safe even from menace, she hears from afar the warring cries of European races and faiths. . . . Had Canada or Mexico grown to be a great power, had France not sold Louisiana, or had England, rooted on the American Continent, become a military despotism, the United States could not indulge the easy optimism which makes them tolerate the faults of their government. As it is, that which might prove to a European state a mortal disease is here nothing worse than a teasing ailment. . . . For the present, at least—it may not always be so—America sails upon a Summer sea.

The "Summer sea," as Bryce prophesied, has become a thing of the past. The balance of power system—which provided the buffer for the United States and in periods of exigency gave it the margin of time necessary for preparations to engage militarily on the world scene—is gone. Along with it has gone the privilege of having a provincial military policy—that is, of having no military policy at all except when one was forced upon us by the breakdown of the power balance abroad and the involvement of the United States in the ensuing war. No longer can we allow ourselves to default on a long range military policy in times of peace. Nor can we permit ourselves to consider foreign policy in a compartment separate from military policy. Our policy must be made with the circumspection of a lawyer and the prudence of a banker, to see that commitments do not exceed resources. This requires constant and close collaboration between those who make our foreign policy and those who are charged with our defense.

Three Major Aspects

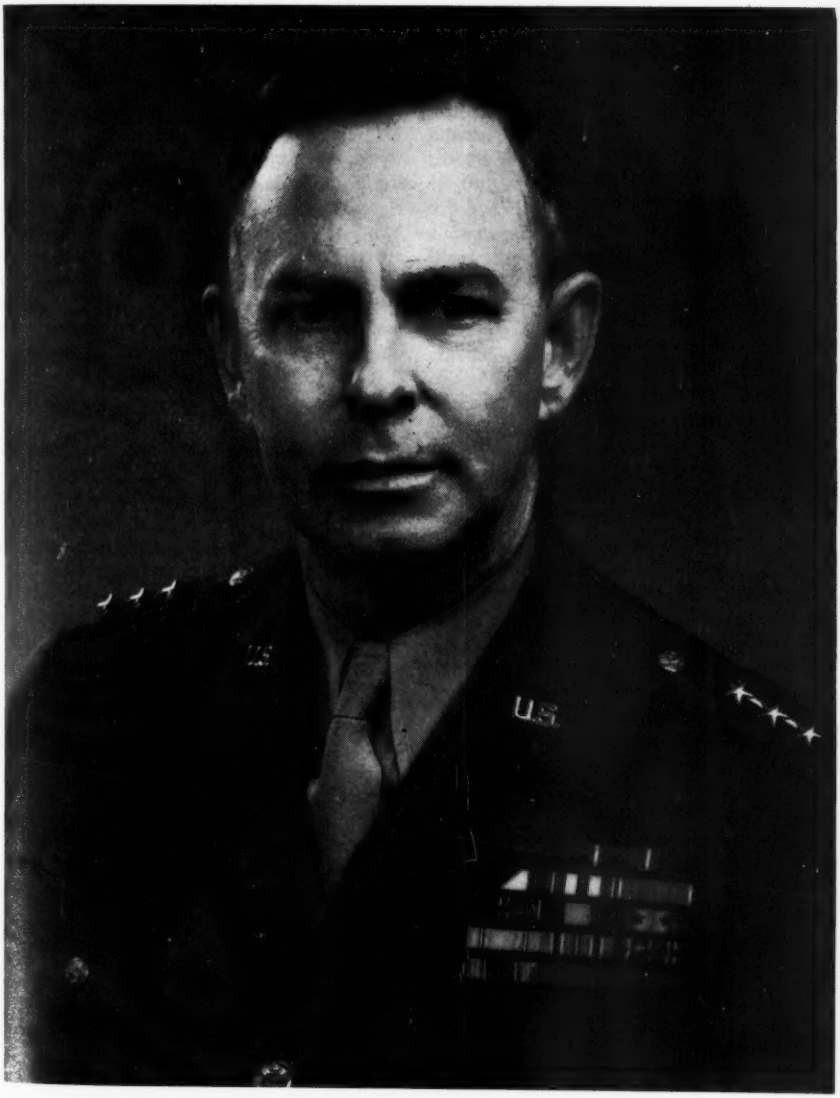
There are three major aspects of war as it might affect us in the future:

1. Our internal security.
2. Our defensive perimeter.
3. Bases for counter measures, when war strikes, and the counter offensive is undertaken.

The most difficult questions, involving definition of a sound military policy so that it can be readily understood by the civilians as well as soldiers, do not arise in connection with internal defense—that is, defense of the continental area of the United States against foreign attack. Nor do they arise in connection with the strategic defensive perimeter, by which I mean the areas bearing directly on defense of the continental area: Alaska, Hawaii, the Isthmian and Caribbean areas, and the approaches to the northeast. Almost all Americans will foresee the necessity of defending these areas and the means are fairly clear to all. It is beyond these matters that the issues of American foreign policy and military policy have arisen in the past and continue to arise now.

The critical question in this century has been that, from the standpoint of her very existence, the United States could not afford to see the Eurasian land mass fall under the dominance of any one power, deliberately embarked on a course posing a definite threat to democratic government; and by suppressing the will of otherwise peaceful people, imposing despotic and tyrannical regimes directed to domination and exploitation. That was the basic issue in the war just concluded.

In the historic past the balance-of-power system relieved us from the neces-



Lieutenant General Raymond S. McLain.

sity of thinking about a foreign and a military policy to prevent any one nation from dominating Eurasia with a purpose of threatening the rest of the world. In the long-range of the future we look to the United Nations to solve many of the war provoking problems arising in the world. The degree of success it may have in preventing war will have to be judged as the course of events disclose its success to that end. Pending the maturing of that institution as a means to promote world peace, however, we have been forced to look to our national power. "It must be the policy of the United States to support free peoples who are resisting attempted subjugation by armed minorities or by outside pressure," President Truman stated in his pronouncement now known as the "Truman Doctrine." That is one of the cornerstones of our foreign policy. Our military policy must go hand in hand with it. Otherwise, the purposes of national security will be frustrated and undermined.

I do not mean to imply that this doctrine is a guarantee of American military action in every conceivable theater. It is not a pact. It is not a contract. It is a declaration that our strategic concerns are no longer subject to geographic delimitation. It is an attitude of alertness, to save us from surprise or siege. Aggression anywhere might be a direct concern to the United States. We say so in advance in the hope that our warning and our expression of willingness to use our power, if driven to it, may deter aggression. It is better that our concern be known than to call it into play after the die is cast.

The Need of Allies

The first conclusion to be drawn from the enormous scope of our strategic undertaking is that we cannot complete the job alone. We shall need allies. To have allies we must undertake more than their liberation after conquest. We must pledge ourselves to mutual defense, or make our position so well known that our probable action would be clear. We must undertake to help them keep a potential enemy from penetrating their boundaries and capturing their territories. This means that we must have adequate forces for fighting holding actions abroad. We cannot afford to concentrate primarily on striking forces lest in so doing we abandon potential assistance in the theaters where we must fight if we are to prevent war from spreading and to keep it from eventually reaching our own shores. In a country with constitutional limitations as we have, we must always expect a defensive phase of military action. This must not only be directed to the purpose of containing an enemy; but to preserve as much of our ultimate offensive potential as possible and to reduce as much as possible the enemy potential. Time, distance, allies, and resources—all are major factors. But they must be accurately synchronized to be most effective, lest we dissipate one before the other is ready.

Secondly, in our own direct interest we could ill afford to let an enemy take over the Eurasian land mass in the hope of dislodging him in a subsequent stage of war. It is an unsound economy of warfare which would yield to a possible adversary the entire resources of the richest and greatest land mass of the globe. Almost any segment of it is valuable strategically. A sound economy of warfare dictates that we must withhold from the enemy's hands as much as we can of the resources in wealth, technical skill, and manpower to assure these for our own use and in behalf of friendly nations in a common cause. Moreover, a power seeking Eurasian domination would certainly seek world domination and on gaining the first objective would have the means to gain the other.

A third point is that we cannot afford to bank on a strategy which envisages the use of material resources that we may not

have or, having them, would lead to their early exhaustion either in prosecuting the war, or in the recovery thereafter.

A fourth consideration is that we must look forward to the peace to follow any war with the same measure of prudence which we use in planning the means to win the prospective war. We should view plans with circumspection as they bear on the attrition of our natural resources, such as petroleum, which is the lifeblood of our industrial processes and our means of transportation in civil pursuits as well as our highly mechanized armed forces. For the nation to exhaust its petroleum in the course of winning a war would leave it in a position of being unable to consolidate the victory it had won. By the same token we cannot afford to bank on a strategy which lays indiscriminate waste to the area taken over by the enemy. The victory we win must not be a Pyrrhic victory. It must not be a victory that leaves the world industrially dislocated and economically depleted to such a measure that a decent peace may be unattainable. A victory that would give us leadership and primary responsibility in such a world would be a precarious one indeed.

In our military planning we must remember that war is not an end in itself. It is only a means to an end. The end is the peace that follows. Elements of prime importance are timing and concentration of power, accurately balanced and with type of troops and means directed to a definite objective.

We must plan to have a force capable of holding vital areas in other continents as well as our own and of protecting them against the vast destruction implicit in modern warfare. I believe this necessarily means that land armies are still the foundation of a sound strategic policy; especially if it must be waged against a power occupying a large land mass. I do not believe this conclusion is gainsaid even if we concede the premises of those who anticipate that the next war will be fought largely in the air—and I certainly do not wish to dispute the tremendous power of air forces. I simply speak to the subject of balanced force and relative readiness directed to definite purpose, and the tasks at hand.

It is quite apparent that the efficiency of air power is multiplied if the distance a plane must fly to deliver its bombload is reduced. It is in the air a shorter time; fighter protection can be provided for a longer period; there is less chance of its being detected. By requiring the enemy to move greater distances through the air, thus necessitating increased fuel loads, the chance of interception is increased, the amount of destructive cargo he could carry and the number of planes he could use would be limited and the effect greatly reduced. Obviously, then, we should forestall the enemy from occupying areas from which he could easily reach the United States by air attack. So, in addition to restricting the use of the enemy's air forces in the initial stages of a conflict, such a strategy would multiply the efficiency of our own Air Force and would facilitate an all-out offensive when we were mobilized and ready to strike. Implicit in this proposition, and without in any way minimizing air power, we can see quite pertinent to this discussion the role of the Army is still a major factor. That is the subject we are examining at the moment. It takes ground forces to secure and operate such bases.

The Army's Role in the Future

I think we should try to get away from the idea that any one phase of warfare is the decisive phase, as it is commonly interpreted. It is entirely possible that the "decisive action" could be won, and yet ultimate "decision" lost. It could well be argued that Hitler took decisive action early in the last war, but he lost the final decision, because he neglected the elements vital to decision in the fi-

nal phase. War has many aspects. They relate to each other as parts of an integrated whole. Each of them is essential to the total picture. Subtract any one of them and the nature of the war would be transformed. In that sense each is decisive. My meaning is not to say here that ground warfare will be *the* decisive phase of the next war, if it comes. I go no further than to say that ground warfare will be vital for decision—if our enemy is a determined one and occupies a large land mass, as Germany did this time. Navy, Air Force, and ground Army will all play their indispensable—and therefore decisive—parts within their respective fields in the military conduct of war. Their relative importance will depend on the circumstance of the enemy.

To single out any means of warfare as the dominant means is too likely to lead to undue emphasis in preparation and to unbalance among the forces. This can result only in uneven and disjointed prosecution of the war. In the Army we must take care that adequate emphasis be given to the role of the ground forces. That is *our* great concern. Nobody else is likely to carry *our* problem. They have their own. Yet we must be ever cognizant of the part other services will play, because what they can properly do reduces our problem that much. Unbalance either way will work adversely to the national security. We must insist that our role get its proper recognition and proper support, both in relative readiness, and in strength proportionate to losses incurred in doing our job.

Another war would be different from the last, for no war is a facsimile of a preceding war. Yet it would not be entirely different, for no war breaks entirely with the past.

We can expect, then, if another war comes, it will be fought in large part with weapons that were familiar to those who fought in the last war. They will be improved in accuracy, mobility and power. They will be supplemented by other weapons which were in an experimental stage or not yet thought of in World War II. So far as ground operations are concerned, I believe the same relationship will exist between the weapons of World War II and the theoretical next war as existed between the weapons of World War I and World War II.

The weapons of World War I were simple in comparison with the weapons of World War II. They were principally the rifle, bayonet, machine gun, artillery, grenade, gas, and crude mortar. Air power and armor appeared, but only in a limited scope. The handling of these weapons required a relatively simple organization.

World War II had all of these weapons with the notable exception of gas, which was in potential though not actual use presumably because the enemy was restrained from using it due to the preponderant supply held by the Allies. I think there is too little thought being given to the idea that we might find the use of the atom bomb in a similar status, depending on circumstances. Most of these weapons, as used in World War II, were greatly improved types. Air power and armor attained stages of development undreamed of in the preceding war. World War II also brought vast changes in the techniques of airborne, amphibious, jungle, and mountain operations. Rockets, the *Nebelwerfer*, V-1 and V-2, the Bazooka, mines, tactically employed radio and radar were significant additions to armament in World War II. Of major significance was enhanced mobility.

Specialization

To train all combat troops in the use of all of these weapons is obviously impossible. Specialization must keep pace with diversification. But in one sense the combat soldier must understand all of these weapons—in the sense of knowing how to defend himself when they are brought to bear against him in the hands

of a trained enemy. They will *all* be there seeking to destroy him. Each soldier also must understand the operation of these weapons to the extent necessary to provide sufficient flexibility to get the maximum utility out of the weapons when employed under varying exigencies of combat. In these days of three-dimension warfare, "fifth column" activities, great mobility of ground operations, and employment of *blitz* tactics, we cannot safely omit any soldier from the necessity of obtaining a modicum of familiarity with the basic weapons of combat. It is not possible to maintain garrisons devoted entirely to defending installations in the rear areas. It is impossible to recall troops from the front to fend off sudden sorties behind the lines due to fifth column activities, air drops, or breakthroughs. Time and the demand for their presence at the front lines would not permit this. The defense of rearward installations therefore must be left to the service troops at hand, and they may find it necessary to fight front line type action.

I recall that during the drive across France, the 90th Division, which I commanded, was struck frequently on the flank. Major forces penetrated far behind artillery positions and division headquarters. To ward off such attacks, artillery pieces were wheeled out of position to become antitank weapons. Truck drivers, clerks, signal people took position and manned the weapons which had been given to them for just such a purpose and not merely for ornamentation. Any man who carries a weapon should expect to use it. Near the town of Briey, in the Metz sector, an entire *panzer* brigade penetrated the front and overran the division area, which at that time exceeded a 35-mile front with a vulnerable flank. The brigade's mission was to relieve a garrison which had been surrounded by our forces. In an all-night and all-day battle fought entirely behind the lines, more than 80 per cent of the brigade was destroyed—twenty-five heavy tanks out of a total of thirty-four; more than sixty armored vehicles out of a total of seventy-five; some 300 dead left on the battlefield and approximately 400 prisoners. It was easy to see that the firepower behind the line was as great or greater than on the line when men stood and fought to preserve their position.

Basic training in the use of the fundamental weapons is as essential to modern warfare as elementary education is to our social order. It is just as necessary for those engaged in new types of combat to have this basic training as it is for those undertaking higher education to have elementary education. It is fundamental to warfare that as long as men walk on the earth, use wheeled transportation, or must return to the earth to maintain themselves, the basic elements of land warfare will have a high priority in the conduct of war. Against a determined power occupying a large land mass, large ground forces are the only element capable of delivering the final decisive blow. When the doughboy walks over a piece of enemy territory no more resistance comes from it. Infantry is "queen of the battlefield" now as ever; even as the airship is "queen of the air" and naval craft is "queen of the sea." Their relative importance is geared to the type of action required. Any one of the three services may be the decisive factor according to the nature of the opposing force and his circumstance.

Artillery

Artillery, the modern counterpart of the ancient catapult, still has a critical role in combat. It is on record that artillery produced 67 per cent of all casualties suffered by the French in World War I. Yet the Germans neglected the implications of this in World War II; they neglected artillery and concentrated on air power and armor. The new weapons

produced vast results, of course, but the lack of the old weapon of artillery was critical in decisive stages of the war. This was the general view of German prisoners. The remark "if we had your artillery, we could conquer the world" was a truism. Artillery stopped Rommel at El Alamein. A preponderance of artillery power determined the issue at Salerno, Anzio, and Normandy. Had the Germans been equally well equipped and prepared in artillery, the attacking armies could not have survived on those battlefields. It is useless to attempt to argue whether artillery contributed 5 per cent or 75 per cent to the Allied victory in those issues. The point is that it produced a proportion of success without which the entire ventures would have failed. To scorn the old weapon simply because it is old invites defeat at the critical junctures.

I have simply used artillery as an example. The same thing could have been said of infantry, of engineers and signal troops. It is no less true of medical troops. The efficiency in handling the wounded and restoring their combat effectiveness often supplied the margin in manpower which determined the outcome of a campaign. One of the most underrated factors in this past war also was our mobility. It made every ground combat soldier worth two or more. It permitted General Bradley to concentrate a fight at Aachen. He took full advantage of it to prevent von Rundstedt making him conform to German dispositions, thereby gaining time the Germans badly needed. When they struck, General Bradley turned Patton's army against the flank of the German salient in the Ardennes in a matter of hours. No other nation could have done this in days or weeks. Bradley had tested the question in his daring moves out of Normandy following the breakthrough there.

My view of the nature of the weapons upon which the outcome of the next war will be determined is a relatively conservative one. I do not wish to minimize the power of the new weapons. I simply assert that in future warfare we must not forget the power of the old ones—either in its major aspects or special circumstances. Nor should we forget that every weapon tends in time to be challenged by an effective defense. The history of warfare has produced many examples of weapons which were believed for a time to be the absolute weapons. The invention of dynamite was hailed, at its discovery, in the same way the atom bomb is today. Just as repeatedly the defender has found means of warding off the new method of attack or surviving it. The very fact that each new weapon has been taken over by the adversary tends to neutralize its ultimate advantage.

At certain stages of the last war, armor appeared to have attained the importance of being the major factor on the ground. The bazooka, however, emerged as an effective counterfoil. I recall an incident at the Battle of Chambois closing the Falaise pocket. A team of two men who had never before fired a shot in combat and who had used only five practice rounds in training knocked out four M-4 tanks in ten minutes with five shells from a bazooka—a weapon which in the meantime had been brought to a high state of efficiency. The bomber, the Daisy-chain, and the mine are among the other techniques which have been brought to a high state of efficiency in combating armor. Nevertheless armor is here to stay and has not been ousted from its place as one of the great weapons of the modern battlefield.

Air power developed to a stage in World War II which was undreamed of in the preceding war. But even its effectiveness has been neutralized in part by the proximity fuze, the jet fighter, radar, mechanical aiming devices, and the like. To what ex-

tent these will prove to have limited the scope of the development of air power only the next war can tell. Surely no one will argue that air power will not remain a great factor in battle. It will always be a major factor. There are many circumstances where it may be the dominant factor. I can think of no circumstance, in a major war, where it will not be a major factor.

Atomic Limitations

In many quarters the atom bomb has been termed the absolute weapon. I believe, however, there are ample grounds on which to doubt that it will be the sole determinant of the outcome in future battle. It is alleged, perhaps validly, that there is no defense to it. But this would relate to time of detonation. There are other areas of circumstances which pose limitation.

The atomic bomb remains subject to the limitation that the conduct of a campaign must be directed to the ultimate purpose of the campaign. Neither side can afford to so conduct a campaign as to defeat the ultimate objective of the war effort. If campaigns were conducted entirely upon the territory of the adversary; or if the sole purpose of the campaign were the destruction of the resources of the enemy; or if his industries, ports and centers of communications were highly vulnerable; the use of the atomic bomb would be greatly simplified. But there are obvious reasons inhibiting its use in a campaign conducted upon the territory of a potential or actual ally, or upon one's own soil. Likewise, it would be foolish to destroy cities and their populations in a sector of the enemy's supporting territory when the objective of the campaign is to cut off the sector and exploit or conserve the resources of the area.

For example, the splitting off of Italy from Germany in the last war gave us a tremendous advantage in advancing our air effort closer to our targets through the use of Italian air fields. It also enabled us to pin down a large portion of the enemy troops. The friendly attitude of the Italian people as our troops overran their country was a great factor in this situation. Had they been hostile, it would have required many more troops to create conditions under which we would be able to make use of the area. Under such conditions as obtained in the Italian campaign, it would have been out of the question to have used the atomic bomb there, for its use would very likely have alienated the Italian population and directly defeated the purpose of the whole effort, as well as have raised moral issues of great import.

The prospect that if another war comes it may at least in its initial or final phases take on the form of guerrilla warfare suggests circumstances in which the use of the atom bomb may be inhibited. Such warfare particularly requires ground troops trained in what might be called the more ancient weapons. It entails a dispersion of forces and a furtive mobility.

We should keep in mind that dispersion and mobility have become the rule in modern battle. This in itself places a great limitation on the combat utility of the atom bomb. It is by dispersion and mobility that a seeming paradox has been created—that the growth of power of modern weapons has been accompanied actually by a reduction in destructiveness measured in terms of the percentage of men killed in major battles. No major battles of the last war produced a percentage of casualties for the time engaged as great as similar battles of World War I, the War between the States, or the Napoleonic wars. The same technological progress that has made possible the great marshaling of destructive force has brought equivalent advances in the speed and flexibility of transportation and communications. That has enabled armies to act unitedly over vast areas

and thus neutralize the effect of the firepower brought to bear against them. We no longer deal with "mass" armies. But that does not mean we no longer are confronted with "large" armies. We are, more than ever. This fact of warfare, dispersed yet organized, provides a factor which limits the tactical utility of atomic warfare. Its use would not be profitable against modern armies—in normal deployed formation. It can be used only against installations or concentrated targets. We should anticipate a growth rather than a lessening of dispersion. The growth of air power may determine greater dispersion in the rearward areas than obtained in the last war—with supplies being handled over remote beaches or into air drops, and stored in widely separated small dumps rather than through great ports and in hugh depots. The pattern of dispersion may extend beyond the rear areas into the basic industries of the warring nations themselves. Thus the power of bombing in its old, chemical sense is likely to bring about the situations that will reduce the effectiveness of bombing of the new atomic variety.

It is not my purpose to labor theories about the limited use of new weapons. Each will find its place in the arsenal of modern warfare—but it will not be to the exclusion of the older weapons. We shall still have to plan the use of a wide assortment of weapons, none of which will be the "absolute" weapon. It is a mistake to resolve a case on the apparent outcome of a weapon against another weapon or a specific target. We must also consider the attrition and supply of the victorious weapon.

Relative Readiness

The efficiency of the military establishment can be determined only in terms of the relative readiness of all of its arms. That is the essential meaning of the phrase "balanced force" as it has been used in recent months in discussions of various approaches to the over-all military policy of the United States. "Balance," or "relative readiness," must be the standard by which we shall gauge our preparations for war. We must weigh its impact on our basic economy. We must apply it in measuring our resources in industry and manpower in relation to those of our allies; in measuring our resources against the characteristics of the possible theaters in which we may fight; in measuring the capacity of our services to assist each other in their missions and in relating it to type and character of enemy forces; in bringing firepower into focus with mobility and as against appropriateness of target; in distributing manpower among the combat and service establishments. Just as important, we must balance our force directed to the ultimate war ends, in the peace area as well as in pursuit of victory. When this is done no service will find itself in a minor position.

The Salient Importance of Training

The Army then, I believe, faces a prospect that it will be called again to fight extensively on land, and that it will have to manifest its proficiency in an assortment of techniques if it is to prevail over the enemy.

If our consideration could be limited merely to ascertaining the numbers of men necessary to give us preponderance and therefore security against any potential enemy, and to determining the amount of time necessary to bring these men to the necessary level of efficiency in the use of their arms, the problems of planning and policy for the Army would be simple.

The Army, however, must get its job done with far less. It can obtain men only in the numbers determined by the civilian leaders of the nation. They will balance their decisions against economic, social and political factors. It can train these men only for the time periods permitted

under the enlistment or selective service policy established, subject to the further limitation that other duties reduce the numbers of men available and the time for training. I refer to the duties incident to the Army's own housekeeping, its functions in relation to rivers and harbors, and—this one is of great importance—its caretaking job in the occupied zones of Germany, Austria, Trieste, Korea, and in Japan. The occupation task will continue into an incalculable future. It will demand man hours in vast figures. It will draw greatly upon energies and brains which would otherwise be available for use in support of the Army's more fundamental mission.

It is manifest that the sustaining of a standing "Army in being" in numbers and of a level of training sufficient to guarantee security for the nation is ruled out by the consideration that such a large Army in time of peace would run counter to the spirit of our political traditions and institutions and would put a critical, perhaps an unbearable, stress upon the national economy. The Army as well as the civil population is equally anxious to preserve a high standard of living. The limitations of the situation force a compromise in numbers, which enhances the question of the level of training, for the importance of expertness in its mission grows in inverse proportion to the numbers of an Army. We must look then to the civilian soldier, but we must take measures to assure his strength in numbers and level of training adequate to do his job.

The importance of training was well understood in the early days of the country. I find this reflected in a book entitled "Military Discipline: the Compleat Souldier," said to be the oldest book on military science written on this continent. Its flyleaf says it was published in Boston in 1701, "printed for and sold by Nicholas Boone over against the Old Church." Boone's book tells us:

> No man is born a Souldier naturally, one may more incline to war than another; but the skill cometh not without industry and pains.

Alexander Hamilton showed the same realization eight decades later. He was under no illusions as to what the American Revolution had demonstrated concerning the quality of American militia against British regulars. "War, like most other things, is a science to be acquired and perfected by diligence, by perseverence, by time, and by practice," he wrote in the *Federalist*. As to the idea that inherent fighting qualities would compensate for the hard-learned techniques of battle, Hamilton added: "This doctrine, in substance, had like to have lost us our independence." Hamilton's advice is as sound and as pertinent today as it was in its own day. Numbers is only one of the factors in military strength. The others include level of training, amount and quality of equipment, level of morale, and quality of command. The intrasigeance of willful people who would compromise these questions has cost human lives, blood and suffering wherever it has prevailed, and it has prevailed too often.

Training

I wish here to discuss level of training as it relates to our problem.

The enlistment for the Regular Army in peacetime is usually three years. In that time the Regular soldier may spend 6,000 hours in training, if other duties do not prevent it. An Army of individuals and units with this amount of training can become a flexible force highly proficient in amphibious, airborne, mountain, and jungle operations.

As to the civilian components, the ordinary pattern is two hours a week for fifty weeks a year—or 100 hours—plus two weeks in camp each year embracing 85 to 100 hours of training. Enlistment normally is for three years. Within that three years the individual gets at most about 600 hours of training. This figure

may be taken as typical. While there is about 30 per cent annual turnover, others have more than three years. It is my opinion that from 2,500 to 3,000 hours of intensive training under good instructors and good leadership would be required for an organization to reach the minimum for basic land operations. A unit of the civilian components which may have reached a high level of training within the above pattern may be said to have attained from 16 to 20 per cent of the required state of proficiency. Its capacity of mobilization, therefore, though quite valuable, is inadequate in view of the present velocity of war to the missions of guarding our strategic defensive perimeter. A means must therefore be found to increase its level of training.

That points to the question of Universal Military Training. Under Universal Military Training each youth in the nation would have basic training of six months, or approximately 1,000 hours. If the civilian components were given recruits with 1,000 hours of basic training and could devote 600 hours to team training, the result would give them 1,600 hours or more and raise them from a level of 16 per cent or 20 per cent to a level of 60 per cent or 75 per cent effectiveness for basic land operations. That is a sufficient degree to qualify them for a strategic defensive operation and place them where, within a very few weeks, they would be able to move up and reinforce the regular troops deployed in strategic *offensive* areas to meet ever increasing pressure which they would be facing.

Universal training would contribute in several ways to the economical development of adequate force. It is important in examining Universal Military Training to relate it to the problem of vitalizing our civilian components. It has no direct relation to the immediate problems of our regular forces.

1. It would provide a *training plant in being*, relieving the regular forces of the necessity in times of emergency of being cadred for this purpose.

2. It would raise the civilian components to the *strength* required for them to do their part and—this is more important—lift them to the required *level of training* to perform combat missions immediately on mobilization; thereby, under present troop basis, it would provide 27 divisions, 22 combat teams, 27 air fighter groups in the National Guard alone ready for combat missions as well as an equal supporting group in the Reserves.

3. Thus, in view of these two factors, it would release the regular forces and *free them for immediate action wherever required.*

4. It would provide a pool of *trained replacements* ready to be shipped wherever needed. These replacements would have more training than the Army gave replacements during the last war in the recruit training centers. This training would be given with greater deliberation, with more effective means, and under better instructors. It would enhance the chances of the individual to survive and increase his effectiveness as a soldier.

Universal Military Training would have a residual value in that when these trainees had passed availability for combat service because of age, family responsibilities, occupational duties, etc., they would have the basic training necessary for local security and civil defense. This pre-training would also reduce the impact of mobilization on agriculture and industry. It would contribute substantially to the morale of the country by focusing on each individual at a specific time of his life a sense of responsibility and value in protecting his country.

Universal Military Training would provide pre-training to Reserve Officers Training Corps students, raise the plane of their study in colleges, and enable them to ob-

tain the number of hours of training necessary to make them good officers.

Universal Military Training is still in the blueprint stages. Meanwhile, we have as a temporary expedient the renewed Selective Service system, a measure designed to maintain the troop basis, especially in the Regular forces, in the face of a lag in enlistments and in view of the exigencies of the Army's continuing missions.

The Eightieth Congress in June 1948 authorized a resumption of the wartime system of Selective Service, with certain fundamental modifications. Congress acted in the realization that certain assumptions which were made when Selective Service had been discontinued two years earlier had not been borne out. It had been assumed that peace treaties would be formulated and brought into force to establish a new permanent basis between the Allies of World War II and their erstwhile enemies; that the occupation responsibility would be progressively lessened; that world stability would gradually strengthen; that the authority of the United Nations as an agency of world peace would progressively manifest itself.

The law renewing Selective Service, giving option to 18-year-old youths to enlist for one year and then transfer to civilian components, is constructive legislation and accomplishes some of the purpose of stabilizing the civilian components discussed above. It remains doubtful whether the nation will be willing to accept the Selective Service as a long-range formula in peacetime. Its main drawback from the standpoint of public support inheres in precisely the fundamental respect which differentiates it from Universal Military Training. The benefits of democracy are universal and the obligation to support and defend the institutions of democracy must likewise be universal. Yet Selective Service imposes that burden selectively, not universally. As it relates to the civilian components, it is uncertain as to the strength it will produce. To date it is almost nil.

The injustice of selective imposition of the obligation is serious in peace; projected into war it may become tragic. Inadequacy in numbers of trained men means, in a battle situation, insufficient replacements and thus a cruel ordeal for the men who are fighting. While the 18-year-olds who volunteer and take one year of training will furnish even better trained individuals than those who might be produced under Universal Military Training in six months, they will furnish a much lesser number. We should never again place troops on the battlefield or in critical situations in the world without ability to support or relieve them. Many times in Europe I walked beside men who had fought day after day, week after week, month after month, without relief and heard them complain that they could get relief only by being wounded.

Reluctantly, it will not be my purpose here to dwell upon the undemocratic unwisdom of requiring the few to bear the burdens when all share the benefits. I do insist that, although burdens fall unequally in the course of events, it is quite another thing to plan to that end, deliberately, a challenge to our basic morality. I wish then to emphasize the temporariness and the tenuousness of the Selective Service approach and to stress this along with the fact that we still do not have universal training. In other words, the nation has not yet come to grips with the long-range requirements of its strategic situation.

A Moral for Leadership

All this provides no excuse for the soldier, of course. I repeat what I said at the beginning of this article. The leaders of the Army are obliged to seek what they regard as the minimum resources necessary to insure the nation's security so far

as it relates to ground combat. Although those who are in a position to grant may withhold the full measure necessary for this purpose, the Army's obligation remains to do the best it can with what it has. Indeed, to the degree that resources fall short of requirements, the obligation upon the officer and the soldier is intensified. This leads us to the obligations of leadership in the present situation. Here I want to pay the highest tribute to the service schools, before the last war and now, for the superlative job they did and are now doing in this field.

The payoff is not the proficiency with which occupation duties are performed, not the number of hours we train, not the skill with which we employ arms on the drill field or in maneuvers. The test comes on the battlefield. It is all too easy to assume that when we have placed a force before the enemy things will move and we shall succeed in proportion to the ingenuity of our tactical planning and our fire power. Competence in battle involves a moral quality as well as technical proficiency, however, and many a leader has received a rude and sudden lesson of this when his troops first go into battle. The impulse of green troops is to stop in their tracks at the first contact with the enemy. Troops whose training has reached the best attainable level will face and conquer the impulse from the resources within themselves. If they do not, the issue is up to their leadership. Whether a unit which undergoes initial pause in combat will become stagnant and useless in its position or will be able to rally depends in the first instance on the quality of its leaders. The general experience has been that when leaders take firm hold of the situation and move forward with their troops, the men will follow. But such leadership cannot be provided by men who choose to direct their troops from afar, clinging to their command posts or the safe vantage of a dugout.

The time to get down among the men is not only the first day of battle but the first day of training and to follow the practice just as faithfully in battle. The leader who has followed this principle throughout will probably not find himself or his men wanting on the day of the great test. The leader who has ignored it in training will all too likely find the day of battle too late to establish rapport with his men, and with himself.

Nicholas Boone, whom I have quoted above as the first writer of a book on military science on this continent, realized this. His book contains this homily of leadership:

> He that is a Captain of a Company. . . . is as well to know his own as all the several duties of his Officers, and to be a good Posture-man himself, that when he sees any of his Souldiers handling their Arms in an indecent and slovenly manner, may the better reprove them for the same. And although many captains regard them not, but leave them to be instructed by inferior officers, yet it is a great honour to be a Captain when his Souldiers are taught by himself.
>
> In time of engagements with an Enemy he must Couragiously and wisely behave himself, & encourage his Souldiers of hope of Victory, Cheerfully animating of his Souldiers to fall on. . . .

Boone's ideas, if not his spelling and punctuation, go as well today as they did when he wrote them in 1701, and are as valid for field and general officers as for company officers.

Whatever the echelon that is stagnated, it is up to the leader of that echelon to get his troops moving, whether he is the leader of a platoon, a battalion, a regiment, or even a division or corps. It is the tradition of the sea that the captain should be the last to leave the ship and, in the last resort, should even go down with it. By a similar token it should be the practice in the ground forces that if a command does not fight, the commander must go forward and lead it even if he is the only one who goes forward. This statement is subject only to the reservation that many leaders are given commands which they have not trained, and in which they have not been given an opportunity to develop a fighting spirit. In such case,

even a display of the most desperate courage by the leader would likely do little to get the men moving. Whatever the circumstances, however, the leader must go to the front and be seen among the fighting troops. He must not attempt to run the organization, even as high as a corps, from the Command Post. *It is remarkable the interest and action that gets under way when a crops commander in a hot action shows up with a front line battalion—most remarkable.* It is my firm opinion that courage on the battlefield is the most powerful factor for winning battles—always has been and always will be—atom bomb or no atom bomb.

I recommend this as a rule for higher commanders in battle: That he relieve from command of any unit of a lower echelon, a commander whom he finds at his command post on three successive visits. The commander's place is with the troops. After he has made basic decisions, his staff can run his Command Post and under present communications he can be contacted almost instantly in an emergency. This should be basic to the teaching of leadership. It cannot be overemphasized. Failure in this regard was the cause of many stagnated situations in the last war. There were leaders who initially went into combat with the idea that their first duty was to protect themselves from danger because of their high responsibility. Such an attitude has no validity. All of them are expendable the same as others of their command. It was notable that after the war progressed this attitude disappeared because of changing attitude of leaders and because those who did not change in their attitude were quickly relieved by commanders of higher echelons who recognized this necessity. It was my experience generally that our commanders from the Supreme Commander in the European Theater down found occasion to look personally at the active fighting down to the level of the front line battalions and were ruthless in eliminating ineffectiveness.

My purpose here, however, is not to prescribe a remedy for lagging command in battle but rather to urge that the spirit so necessary in combat enlighten the Army and its leaders in meeting their present obligation to do the best they can with the resources at hand.

To summarize, then, our National Policy and our Foreign Policy is the immediate business of civil authorities.

Our Military Policy must follow these policies and be adequate to their requirements.

In determining the character of the forces to carry out our military policy we must balance it with the purpose desired and the means available. Within the available means we must keep well in mind our basic resources and the possibility of a prolonged struggle.

In building the required force, the increased velocity of war makes it imperative that our Regular forces be free for action anywhere, at any time, and that our Reserve forces be vitalized through some system of pre-training.

Aggressive leadership and personal courage on the battlefield continues to be the outstanding characteristic of any military force, under any conditions.

The Armed Forces of the Philippines

Lieutenant Colonel William L. Osborne, *Infantry*

ONLY one government in the world today possesses armed forces which are patterned almost entirely after those of the United States—the young Republic of the Philippines.*

This is a natural development. For almost fifty years, the United States Army has played an active role in our efforts to promote the welfare and development of the islands—first through the old Constabulary, organized in 1903 and officered and trained for many years by the United States Army; later through the Philippine Army, organized in 1936 under the Commonwealth Government and supervised and trained by General MacArthur; and more recently through the Armed Forces of the Philippines, organized shortly after the Islands acquired their independence. Since March 1947 the new Armed Forces have been assisted in their training and development, and in their procurement of supplies and equipment, by the Joint United States Military Advisory Group, and by Headquarters, Philippines-Ryukyus Command.

Unification

After several months of planning by staff members of the Armed Forces of the Philippines, assisted by members of the Joint United States Military Advisory Group, the details of reorganization were implemented by Executive Order Number 94, issued by President Roxas. By reorganization, the Armed Forces of the Philippines have achieved true unification. The three major components are the Philippine Ground Forces, the Philippine Air Forces, and the Philippine Naval Patrol. All are responsible to the Chief of Staff of the Armed Forces through their respective commanders. The Chief of Staff is responsible to the Secretary of National Defense and to the President as Commander in Chief.

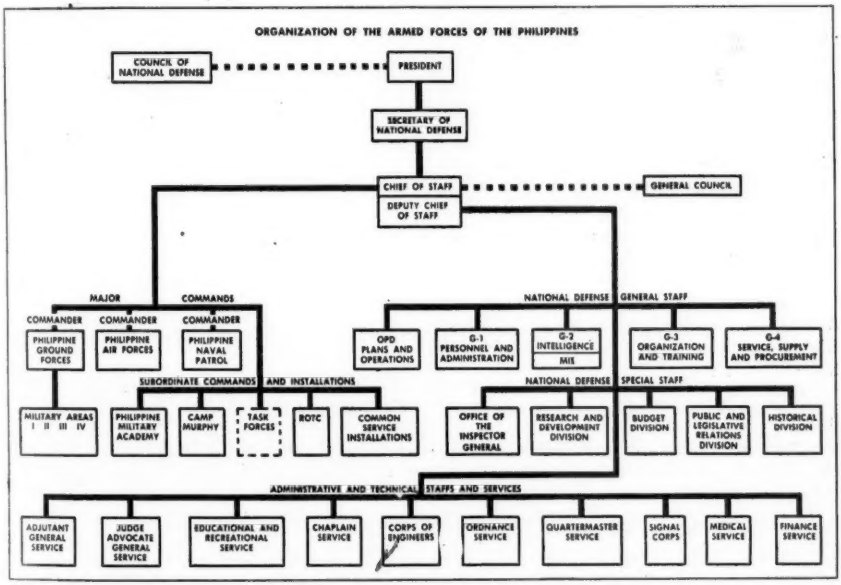
A General Council, consisting of members of the General Staff and the commanders of the major commands, was created to advise the Chief of Staff on matters pertaining to the Armed Forces and on long-range planning. The Chief of Staff is assisted by a Deputy, who exercises general supervision over the General and Special Staffs and the Administrative and Technical Staffs and Services. The National Defense General Staff is organized into five divisions: Plans and Operations; Personnel and Administration (G-1); Intelligence (G-2); Organization and Training (G-3); and Service, Supply

* Printed by arrangement with *Army Information Digest.*

Patterned after the United States, the armed forces of the Republic of the Philippines have already been unified and are making rapid progress toward a well integrated, effective, military organization

and Procurement (G-4). Personnel of the General Staff are to be representative of the Ground, Air, and Naval Forces.

The National Defense Special Staff consists of the Office of the Inspector General, the Research and Development Division, the Budget Division, the Public and Legislative Relations Division, and the Historical Division. The Administrative and Technical Staffs and Services consist of: Adjutant General Service; Judge Advocate General Service; Educational and Recreational Service; Chaplain Service; Corps of Engineers; Ordnance Service; Quartermaster Service; Signal (Corps) Service; Medical Service; and Finance Service.



Military Areas

The executive order abolished the former ten military districts and created four military areas, one for Northern Luzon, one for Southern Luzon, one for the Visayan Islands, and one for Mindanao. These military area commands can be readily transformed into corps or separate division commands in time of emergency. Their primary peacetime function is to aid in recruiting men for the Universal Military Training program, which began with the initial training of 3,000 men in the summer of 1948. All training will be centralized at Floridablanca, Pampanga.

All new members (Reservists) of the Armed Forces, regardless of their eventual assignment to ground, air, or naval commands, will undergo training with the Ground Forces.

The over-all strength of the Armed Forces is approximately 24,000. This figure, however, will vary from time to time as the Armed Forces undergo further reorganization. The strength of the Air Force is 1,700, and the Naval Patrol 1,411.

The three major components are organized along traditional United States Armed Forces lines, except for certain modifications necessitated by natural terrain features and the reduced size of the Philippine forces.

The organization of the supply services

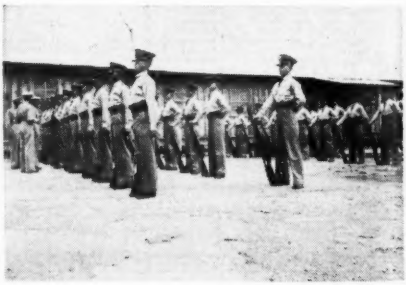
Servicing communications equipment of the Philippine Armed Force.

generally parallels that of the United States Army. Procedures similar to ours have been adopted, modified as necessary by the peculiar conditions which are found in the Philippines. Practically all arms, equipment, and supplies presently in use by the Philippine Armed Forces are of United States origin and were made available from United States surplus stocks. Sufficient stocks either are on hand or will be made available initially to equip the Philippine Armed Forces, including the Reserve units.

Officer Procurement

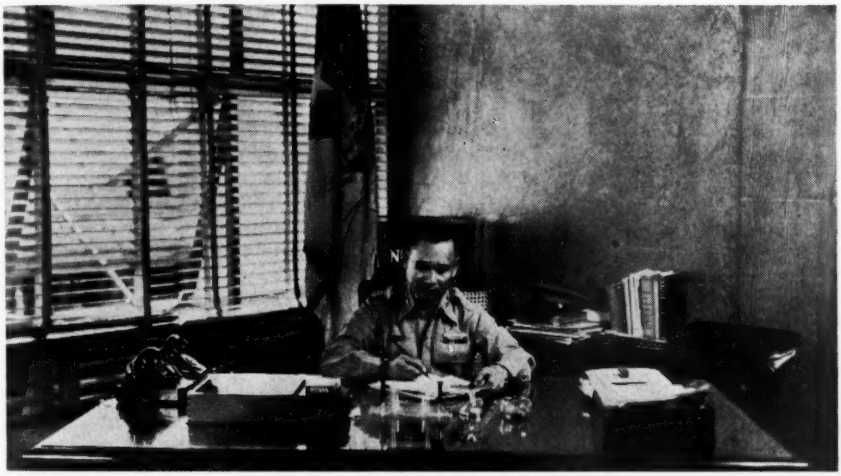
Policies on the promotion and integration of Reserve officers currently are being revised. In general, they will follow the pattern of those of the United States Armed Forces. The procurement of Regular officers, other than by integration of Reserve officers, is from graduates of the Philippine Military Academy. The Academy, located in Baguio, was opened in 1936. Closed during the Japanese occupation, it was reopened shortly after liberation. A committee of former faculty members visited the United States Military Academy, the United States Naval Academy, the Coast Guard Academy, Virginia Military Institute, and Columbia University, to observe teaching techniques and methods. The curriculum and schedules closely follow those of the United States Military Academy. A new class of seventy-five cadets began in June 1948, and there will be one class each year hereafter. New Regular officers for the Philippine Air Force and for the Philippine Naval Patrol are selected from graduates of the Military Academy and are then given specialized training by their own force.

Under the reorganization of the Armed Forces, the former Military Police Command was transferred to the Department



Inspection of cadets at the Philippine Military Academy.

of the Interior and redesignated the Philippine Constabulary. Its mission is the enforcement of law and order. Although the Constabulary will not be a military organization, it will work closely with and receive logistic support from the Armed Forces. Members of the Constabulary



Head of a military force patterned after the United States, Major General Rafael Jalandoni, above, is Chief of Staff of the Armed Forces of the Philippines. Below, a mortar squad of the Philippine Army Military Police Command, now the Philippine Constabulary.—PA Signal Corps photos.

will be part of the Reserve Force of the Armed Forces.

Pay Schedule

Base pay of officers and enlisted men is as follows:

Rank	*Base Pay Per Year*
Major General (CofS)	12,000 pesos
Major General	10,000 pesos
Brigadier General	8,400 pesos
Colonel	6,600 pesos
Lieutenant Colonel	5,400 pesos
Major	4,800 pesos
Captain	3,960 pesos
First Lieutenant	2,720 pesos
Second Lieutenant	2,160 pesos
Grade	*Base Pay Per Month*
Master Sergeant	115 pesos
First Sergeant	95 pesos
Technical Sergeant	95 pesos
Staff Sergeant	75 pesos
Sergeant	65 pesos
Corporal	55 pesos
Private First Class	45 pesos
Private	40 pesos

The ROTC program is in full swing throughout the Islands, with thirty-four senior units having a total strength of 18,000. Units include Infantry, Field Artillery, Engineer, Medical, and Signal Corps trainees. An eight-week camp is held each summer. The program is under the direct supervision of the Chief of Staff of the Armed Forces of the Philippines.

In addition to the thirty-four senior units in the colleges, all high schools in the Islands are required by Philippine law to conduct preparatory military training (Junior ROTC).

An interesting sidelight on American influence is shown in the language of the Armed Forces. Although Tagalog is the official language of the Republic of the Philippines, all Philippine Armed Forces orders, correspondence, and bulletins are in English. English is the common language among officers, although Tagalog and other dialects are used at times when giving verbal instructions to enlisted men.

In the short time that the Philippine Armed Forces have been organized, considerable progress has been made toward creating a small but well integrated and effective military organization, although budgetary limitations may restrict the over-all effectiveness for some time to come.

The real integration of the various elements of our national security will take many months, if not years, before it is accomplished. There will be no miracles or immediate or sensational economies in the process. Like all other human accomplishments the results will be the product of hard and continuous work, of accommodation between many points of view and of a thorough and continuous study of every aspect of what we need to wage successful war.

Secretary of Defense James V. Forrestal

The Breakout at Anzio

A Lesson in Tank-Infantry Cooperation

Lieutenant Colonel Bogardus S. Cairns, *Cavalry*
Former Instructor, Command and General Staff College

A GREAT many lessons were learned and relearned at Anzio. Not the least of these was the value of prior planning, training and rehearsals in operations involving combined use of tanks and infantry. This article will be confined to those lessons learned as a result of the operations of the 1st Armored Division in its breakout from the beachhead at Anzio and its subsequent advance on Rome.

Terrain

Terrain is an important factor in the consideration of the operations at Anzio. The general area of the beachhead is a plain of rolling country sloping gradually to two hill-masses to the north and east (Map No. 1). The Albano hill-mass, otherwise known as the Colli Laziali, to the north, is an old volcano. Its slopes are steep and wooded and it forms a very strong defensive position from which excellent observation may be obtained of the entire beachhead area. The Lepini Mountains to the east are very rugged and they, too, afford good observation of the Anzio plain. Between these two hill-masses is the Velletri—Valmontone pass. This pass is about four miles wide, and consists of rolling terrain leading to the Sacco Valley and Highway 6, the main supply route of the Germans on the Cassino front. To the southeast of the beachhead and between the Lepini Mountains and the sea lie the Pontine marshes, through which runs Highway 7, the main route of advance for the Fifth Army forces from the southern front. This highway runs through Cisterna, one of the main German strong points; Velletri, another strongly held town; Albano, and then on to Rome. Northwest of the beachhead, running from the Colli Laziali to the sea, are a series of deep ravines forming cross-corridors that effectively block the road to Rome in that area.

The wet weather in the early days of the beachhead made cross-country movement of armored vehicles almost impossible. By early May, however, the weather had cleared so that tanks could move cross-country in most parts of the beachhead. By the time the 1st Armored Division made its breakthrough, the ground in the zone of its attack was excellent for cross-country movement, except for some places in the low ground.

The road net was excellent, although some of the roads were very poor in the wet weather of the early beachhead days.

Among the lessons learned at Anzio was this: That early planning, training, and rehearsals for the tank-infantry units paid large dividends in rapid advances during the first days of the attack

Beachhead Defense

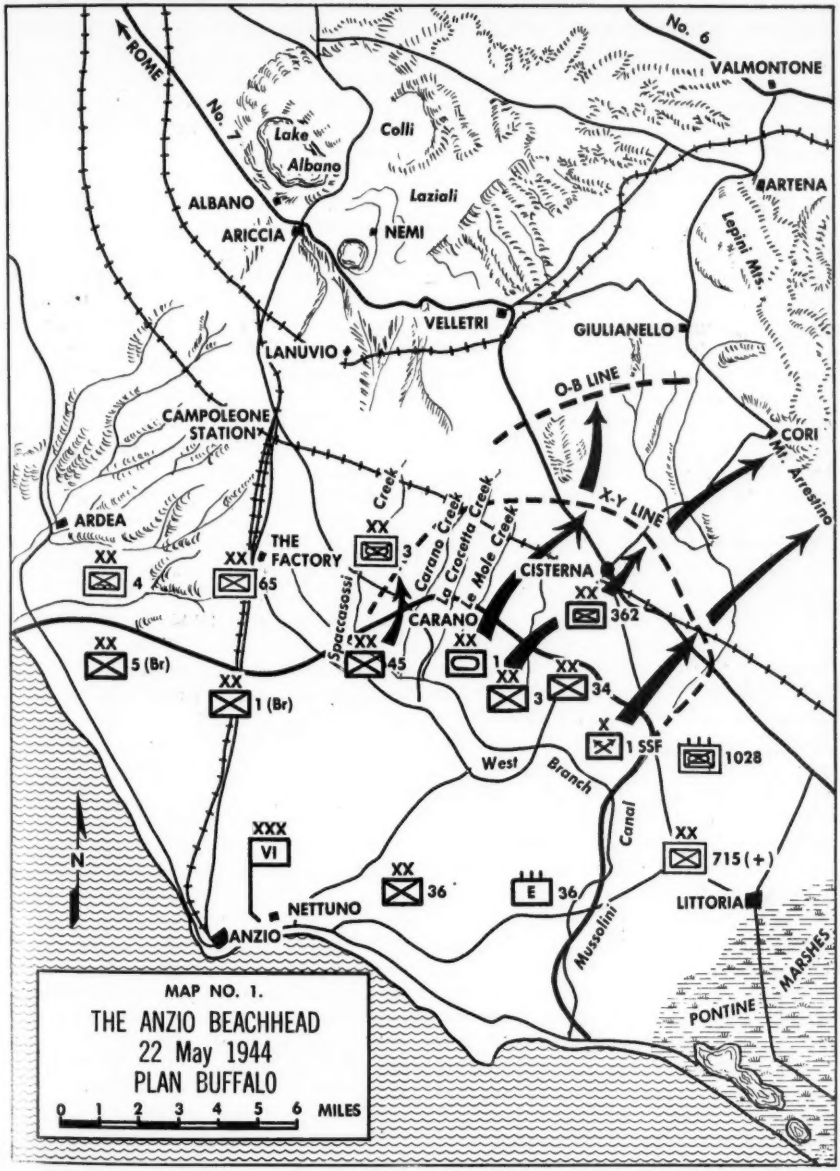
The 1st Armored Division, less Combat Command B, had arrived on the beachhead by 1 February (D+9) and had taken a prominent part in the Allied offensive of 30 January—1 February. It had done its share in defending the beachhead against the determined German offensives during February. After these offensives had failed, the beachhead line stabilized and the division settled down to receiving and training replacements and generally preparing for the attack to break out of the beachhead, which was sure to come in the near future. Combat Command B was brought to Anzio from the Cassino front about the first of May, bringing the whole division together again.

Because of the constant pounding by enemy artillery most of the beachhead installations were well dug-in, with many of them going entirely underground. The 1st Armored Division went to the extent of building two underground theaters, each with a capacity of two hundred men. Tanks were dug-in and fox holes were protected with sandbags, tarpaulins, and camouflaged roofs.

Life on the beachhead developed a defensive attitude in the troops that had to be changed before the new offensive from the beachhead could be launched. In order to integrate the many new replacements into units and get the men in an offensive frame of mind for the coming operations, an intensive program of tank-infantry training was instituted. Such available rear areas as were not under the direct observation of the enemy were used for this training. Tank units underwent platoon, company and battalion exercises working with the infantry units with which it was expected they would operate in the coming offensive. The minutest details of tank-infantry cooperation were worked out. Telephones were installed on the rear of tanks to permit the infantryman on the ground to communicate with the tank commander so as to give him instructions or to point out targets that were holding up the infantry. Tank platoon leaders and company commanders installed SCR 300 radios on their tank turrets to insure radio communication with their supporting infantry. Arrangements were made to carry extra small-arms and mortar ammunition on the back decks of the tanks to make the infantryman's burden lighter and to insure an adequate resupply of ammunition once the attack jumped off. Smoke and pyrotechnic signals were arranged to permit the infantryman to make his wishes known to the tankers. All these details and others were put into practice in the training exercises until all personnel in the units were thoroughly familiar with them. Where possible the exercises were played over terrain that was similar to that over which the units would attack. Terrain tables were built and the leaders of the tank and infantry units went over their plans together and tried to foresee every contingency that might affect their plans. All commanders, down to include most of the combat platoon commanders in the division, spent at least one hour in a cub plane studying the terrain over which they would advance.

Training

While the lower tank and infantry units were training together and working out solutions to their various problems, commanders and their staffs were busy perfecting the over-all plans for the breakout. Three general plans were considered: plan "Grasshopper," to breakout to the southeast in order to join with the main Fifth Army offensive moving up from the south along Highway 7 through the Pontine marshes; plan "Turtle," to attack on the left to breach the Factory salient and continue the attack to the west of the Colli Laziali and on to Rome via Highway 7; and plan "Buffalo," which was to attack to the


ROME
No. 7
No. 6
VALMONTONE
Lake Albano
Colli Laziali
ALBANO
ARICCIA
NEMI
ARTENA
Lepini Mts.
VELLETRI
GIULIANELLO
LANUVIO
O-B LINE
CAMPOLEONE STATION
CORI
Mt. Arrestino
X-Y LINE
ARDEA
THE FACTORY
Spaccasassi Creek
Carano Creek
La Crocetta Creek
Le Mole Creek
CISTERNA
CARANO
5 (Br)
1 (Br)
West Branch Canal
1 SSF
1028
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XXX VI
36
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NETTUNO
ANZIO
LITTORIA
Mussolini
MARSHES
PONTINE
N
MAP NO. 1.
THE ANZIO BEACHHEAD
22 May 1944
PLAN BUFFALO
0 1 2 3 4 5 6 MILES

northeast on the Cisterna front to capture Cori and Velletri and to continue on through the Velletri Gap to capture Valmontone and cut Highway 6, the main supply route of the German Tenth Army holding the Cassino front. Although plan "Buffalo" was adopted on 5 May, preparations were also continued on the other two plans for deception purposes.

In plan "Buffalo" (Map No. 1), the 34th Infantry Division, in the line below Cisterna, was to prepare gaps in the mine fields through which the 1st Armored Division, 3d Infantry Division and the 1st Special Service Force would attack to seize initially the X-Y line. These attacks were designed to cut Highway 7 north and south of Cisterna, while the 3d Infantry Division took Cisterna itself. The 45th Infantry Division was ordered to expand the left flank of the penetration as far as the railroad. The British 1st and 5th Divisions on the left were to launch local attacks to contain the German forces on their front and divert their attention away from the main attacks. In the second phase of the attack the 1st Armored Division was to continue on to seize the O-B line and hold this line prepared to continue in conjunction with the 3d and 36th Infantry Divisions to seize Artena and cut Highway 6. The 36th Infantry Division was to pass through the 3d Infantry Division beyond Cisterna and continue the attack through Cori, with the 1st Special Service Force on their right seizing Monte Arrestino and then continuing on to the east.

On the night of 11-12 May the main Fifth Army attack was launched on the Garigliano front between the Liri Valley and the sea in conjunction with the Eighth Army attack up the Liri Valley from the Cassino front. After a week of tough fighting the British captured Cassino and the mountains to the north and began the push slowly up the valley and Highway 6 against strong German opposition. Fifth Army, with the French Expeditionary Corps on the right in the mountains and the II Corps along the coast, broke through the Gustav line after three days and began its drive northward toward the beachhead at Anzio and towards Rome.

In the meantime the VI Corps in the beachhead was making its final preparation for its breakout. The artillery throughout the beachhead began a schedule of concentrated firing for fifteen minutes every twenty-four hours during which practically every gun on the beachhead opened up. The purpose of these shoots was to mislead the enemy as to the time of our attack and force him to uncover some of his defensive fires.

On 19 May the concentration of units for the attack started. The attack was to have jumped off the morning of the 21st but progress on the southern front was slower than had been anticipated so a postponement until the 23d was finally ordered.

On the night of 22-23 May final preparations were made. Mine fields along the Cisterna front were gapped by the infantry and engineers of the 34th Division. The British launched several small-scale attacks on their front, receiving a violent reaction from the enemy.

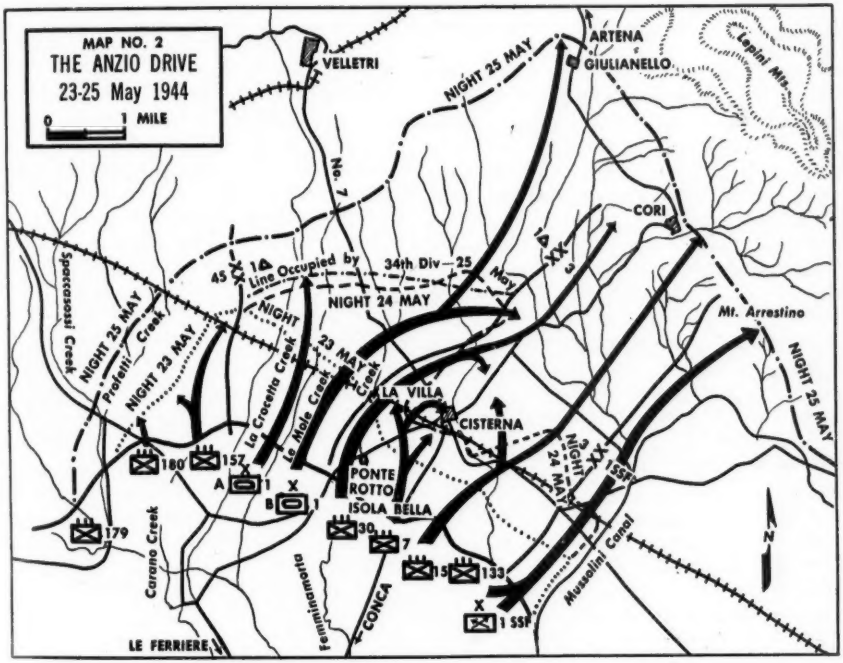
The Attack

Shortly after daylight on 23 May the artillery began what appeared to be another of the daily shoots, only the tempo was stepped up. At 0625 light bombers and fighters added their weight to the attack. Five minutes later the artillery stopped and our tanks and infantry attacked all along the front. Complete surprise was achieved. Our artillery fire had destroyed assembly areas, command posts, and dumps and had completely disrupted the enemy's communications, causing an initial disorganization from which he never fully recovered.

The 1st Armored Division attacked with Combat Commands A and B abreast, Combat Command B on the right (Map No. 2). Combat Command A consisted essentially of the 1st Armored Regiment and the 135th Infantry Regiment of the 34th Division. Combat Command B was built around the 13th Armored Regiment and the 6th Armored Infantry Regiment. The

It was originally intended to blow gaps in the mine fields in both combat command zones by using six "snakes," each consisting of 400 feet of metal encased explosive. Combat Command A used theirs successfully, not only gapping the mine field but thoroughly panicking three enemy strong points.

Combat Command A attacked with two



division reserve comprised the 2d Battalion, 6th Armored Infantry; the 3d Battalion, 135th Infantry, and the 3d Battalion, 13th Armored Regiment. Both combat commands were supported by a company of armored engineers and a company from the division medical battalion. The division artillery, backed up by considerable corps artillery and the artillery of the 34th Division, gave adequate support to the attack.

waves of medium tanks, leading the way through the gaps made by the "snakes." These were followed by waves of infantry from the 135th Infantry, closely supported by light tanks. The mission of the light tanks was to assist the infantry moving forward by destroying enemy machine guns or strong points that were missed by the leading waves of medium tanks. It was here that all the preparations and joint training of the

infantry and tanks paid large dividends. The tanks and infantry worked together so well that by mid-afternoon Combat Command A had captured its initial objective along the railroad and by dark had pushed 500 yards beyond. Losses in tanks and infantry in this combat command were very small considering the scale of the attack.

Combat Command B was not so successful in the initial stages of their attack. Trouble was experienced getting the "snakes" into position so it was decided to attack without using them. The attack was launched with the medium tanks leading as in Combat Command A but it immediately bogged down. Within the first hour of the attack some thirty tanks were knocked out or damaged as a result of mines. Here again the teamwork developed between the tanks, infantry, and engineers in the training prior to the jump-off paid dividends. The infantry and engineers went to work under the cover of the tanks and by late morning had cleared sufficient gaps to permit the advance to continue. By nightfall Combat Command B had reached its objective along the railroad at some points.

The attack was resumed at 0530 the next morning after a 30-minute artillery preparation. Both Combat Commands broke through the hastily organized German positions and had crossed Highway 7 north of Cisterna before noon. Combat Command B then drove across the valley toward Cori and by dark leading elements had reached the Cisterna-Cori road. Combat Command A turned northwest after reaching the highway and attacked toward Velletri against stiffening enemy resistance. The medium tanks again started in the lead but because of the high corn stalks and vineyards, which impeded the tankers' observation and made the going very difficult, the infantry and light tanks were passed through to lead the attack. This attack had progressed about a mile by dark.

Fall of Cisterna

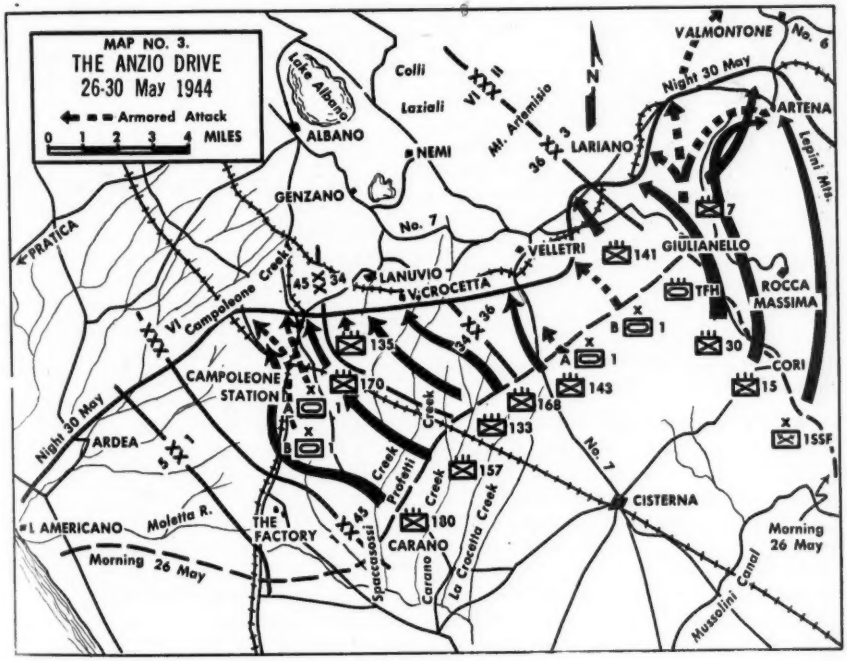
On 25 May Cisterna fell to the 3d Division and by nightfall the 3d Division and 1st Special Service Force were at the base of the Lepini Mountains before Cori. The 1st Armored Division continued its attack towards Velletri with Combat Command A. Combat Command B exploited the collapse of the Cisterna resistance with the 13th Armored Regiment followed by the 1st Battalion, 6th Armored Infantry, and by early afternoon had cut the Cori-Velletri road at Giulianello. Also on this date a task force from the 36th Engineer Combat Regiment advancing southeast from the beachhead through the Pontine marshes made contact with elements of II Corps advancing north from the main Fifth Army front. Anzio was no longer a beachhead but was now the left flank of the main fighting front.

On 26 May the main axis of the VI Corps attack was shifted from the direction of Valmontone to a direct line toward Rome west of the Colli Laziali (Map No. 3). The 34th Division was to attack from below Velletri to seize Lanuvio, while the 45th Division attacked to capture Campoleone Station. The 1st Armored Division was given the job of taking Velletri. The 3d Division, reinforced by an armored task force (Task Force Howze) from the 1st Armored Division, was to continue its advance towards Valmontone. The 36th Division, which had been initially in Corps reserve and had not been committed, was to plug the wide gap between the 3d Division and the 1st Armored Division.

The 3d Division moved out as ordered on 26 May behind the armor of Task Force Howze and the 3d Reconnaissance Troop. In Task Force Howze one company of tanks cut the Velletri-Valmontone road and the

other two companies moved into Artena against very light resistance. The advance had been so rapid that infantry had been unable to keep up with the tanks due mainly to the congestion on the one road caused by the many knocked out and demolished German vehicles. Consequently when the tank force in Artena was ordered to continue its advance to Highway 6, it was forced to leave Artena undefended, and go on toward Highway 6, still without infantry support. This force reached Highway 6 overlooking Valmontone just before dark but was recalled by the 3d Division commander because it was impossible to get either infantry support for the night or supplies up to it. In the meantime elements of the Hermann Goering Panzer Parachute Division had moved into Artena from the south before the infantry of the 3d Division could reach the town. The 15th Infantry attacked the next day and retook the town. Highway 6 was not reached again until 1 June. If circumstances had permitted the infantry to keep pace with and support the tanks in this situation both objectives might have been held on the 26th and the necessity for further attacks to capture them averted.

The 1st Armored Division attacked toward Velletri on 26 May over close, broken country, ill-suited for armor. The town was strongly defended to the south and east by antitank guns and mine fields covered by fanatical German paratroopers who stopped the armored attack. The 36th Division took over the mission of the 1st Armored Division during the night of 26-27 May and the armor went into reserve for maintenance.



The 34th and 45th Divisions in their attacks on 26 and 27 May met chiefly long-range fire covering the enemy withdrawal and advanced to within less than two miles of their objectives at Lanuvio and Campeleone Station. Since it appeared that a breakthrough might be made at any time, the 1st Armored Division with the 2d Battalion, 135th Infantry attached was alerted to attack through the 45th Division on 28 May. The 142d Infantry of the 36th Division was motorized and ordered to be prepared to follow the 1st Armored Division in the event a breakthrough was made.

On 28 May the 34th and the 45th Divisions continued their advance against the enemy, who was slowly withdrawing to his main line of resistance. Resistance stiffened on the right in the Lanuvio sector causing the line to swing gradually to the left. The British 1st and 5th Divisions were ordered to keep pace with the advance of the VI Corps. The 1st Division occupied the Factory without opposition and continued its slow advance to the northwest.

Corps Reserve

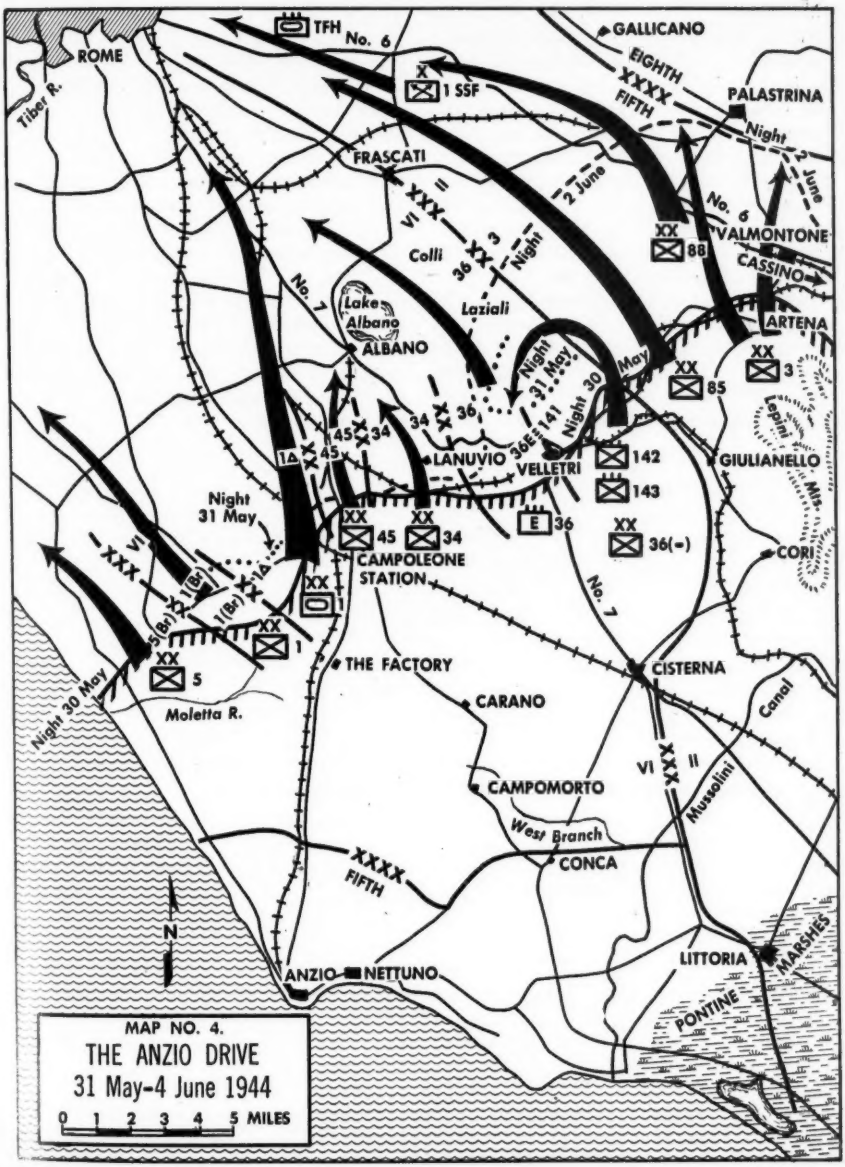
Since it was becoming evident that more pressure was necessary to crack the Lanuvio line, the 1st Armored Division—VI Corps' last major reserve—was ordered to move through the 45th Division and attack up the Albano road on the morning of the 29th. The division attacked with combat commands abreast, Combat Command B on the left supported by the 180th Infantry. Tanks of the division cleared Campoleone Station by noon and continued to push north across the scrub-covered wadis of the area. By afternoon the tanks had pulled well ahead of the infantry. As the attack approached the enemy main defensive line the opposition increased greatly. The tanks began to take serious losses from antitank guns and tanks and were also harassed by close-range infantry opposition. Strong points by-passed by the tanks pinned down the infantry and effectively disrupted any tank-infantry mutual support during the afternoon. It was necessary to pull the tanks back to the line of infantry during the night. Here again, lack of proper tank-infantry cooperation caused the attack to bog down.

On 30 May Combat Command B attacked northwest along the Campoleone railroad and by dark had stabilized its line along Campoleone Creek. This time the tanks and infantry kept in close contact with each other rendering the mutual support necessary to a successful tank-infantry attack.

At dusk on 30 May the Fifth Army drive appeared to have been stalled. On the left flank west of the Colli Laziali the 1st Armored Division and the 45th Division had fought bitterly and unsuccessfully along the Albano road; the 34th Division had failed to crack the Lanuvio position; the 3d Division had been on the defensive in front of Valmontone since 27 May. II Corps had taken over the front east of the Colli Laziali and was moving in the 85th Division to reinforce the 3d Division. However the picture was much brighter than it looked on the surface. In a reorganization and reshuffling of German units, the mountainous region of the Colli Laziali, just east of Velletri, was almost denuded of German troops. When this fact was discovered, Fifth Army was quick to exploit this weakness. The 36th Division moved into this gap late in the evening of 30 May and by dawn, undetected by the enemy, had made a deep penetration up the steep slopes of the Colli Laziali and secured positions which outflanked both enemy corps (Map No. 4). When the Germans discovered this move they counterattacked but were unable to dislodge the 36th Division.

German Withdrawal

During the next three days (31 May-2 June) the Germans fought hard, but


ROME
Tiber R.
TFH No. 6
1 SSF
GALLICANO
EIGHTH
XXXX
FIFTH
PALASTRINA
Night 2 June
FRASCATI
XXX VI II
2 June
No. 6
XX 88
VALMONTONE
CASSINO
Colli
36 XX 3
Night
No. 7
Lake Albano
Laziali
ALBANO
ARTENA
Night 31 May
May
XX 85
XX 3
Lepini Mts.
Night 30 31 May
141
45 XX 34
34 XX 36
1A XX 45
LANUVIO
36E
VELLETRI
142
143
GIULIANELLO
Night 31 May
XX 45
XX 34
E 36
XX 36(-)
CAMPOLEONE STATION
CORI
VI XXX II
1(Br)
5(Br)
XX 1
XX 5
THE FACTORY
CISTERNA
No. 7
Night 30 May
Moletta R.
CARANO
Canal
CAMPOMORTO
VI XXX II
Mussolini
West Branch
CONCA
XXXX FIFTH
N
ANZIO
NETTUNO
LITTORIA
MARSHES
PONTINE
MAP NO. 4.
THE ANZIO DRIVE
31 May-4 June 1944
0 1 2 3 4 5 MILES

when the II Corps swept around to the north of the Colli Laziali along Highway 6 and the 36th Division deepened its penetration, the enemy decided it was time to pull out. On the night of 2-3 June the Germans withdrew northward and on 3 June all elements of the Fifth Army were in hasty pursuit of the retreating enemy. Early on the morning of 4 June the first American troops reached the outskirts of Rome and by evening held the entire south bank and the bridges over the Tiber.

In studying this campaign from the viewpoint of tank-infantry cooperation, several things are evident. All the early planning, training, and rehearsals conducted by the tank and infantry units which were to work together in the initial attack out of the beachhead paid large dividends in the rapid advances made during the first few days of the attack. In the later phases, when strange units were thrown together to make hastily organized attacks against determined enemy resistance, the lack of cooperation and understanding caused many attacks to fail. In the several instances where the tanks ran away from the infantry, or the infantry failed to keep up with the tanks, all that was gained by the tanks was eventually lost because the tanks had to return, either to crush the by-passed resistance that was holding up the infantry or to come under the protection of the infantry for the night in order to try again the next morning.

Armored infantry and tanks supported by artillery operate in close coordination. Seldom will tanks operate without infantry support.

Field Manual 100-5, Operations.

The Army Education Program

Colonel Walter E. Sewell, *General Staff Corps*
Chief, Army Education Branch

MODERN warfare has become so complex that a soldier must have a certain educational background before he can be trained effectively. To send soldiers into the front lines who have not received proper training, because they do not possess the necessary education, constitutes a most dangerous and ineffective use—if not outright waste—of manpower. Elementary activities of every day tactical operations, such as zeroing the rifle and map reading, cannot be mastered by those who do not possess a basic knowledge of the three R's. This bears on the problem of educational training in its most elementary aspects. We all know that the weapons of war tend to become more complicated as time goes on. No wonder, then, that the demands for educational attainment by the individual soldier should grow in direct ratio to the complexity of modern warfare.

Army Education Program

To provide the required educational training—not only in the elementary phase mentioned above, but in all its phases, up to and including college subjects—the United States Army has established an Education Program. Certainly, in view of the mounting number of techniques which a soldier must master and the broadening scope of missions assigned to an army, the introduction of any new activity must be carefully considered. Thus, the very fact that the Army Education Program has been made a permanent activity of the United States Army is ample evidence of its value. This program is defined as that part of the educational activity of the Army which is devoted to instruction in subjects normally taught in civilian institutions for the purpose of raising the educational level of the individual, and which is not a part of the military training program. It is organized so as to fit into the existing establishment with a minimum of cost in personnel and dislocation of normal military duties. Its mission is to serve the Army as a foundation for training and as a booster of morale. Its specific objectives are:

a. To provide the education necessary for the soldier (officer or enlisted man) to perform his assigned duties effectively, and to enable him to understand the significance of these duties in relation to the function of his unit and the over-all mission of the Army.

b. To enable the soldier to meet the educational requirements for promotion.

One soldier out of every four is now studying voluntarily under the Army Education Program, which seeks to improve his value to the Army and increase his opportunities for service and personal advancement

c. To provide continuing educational opportunities for the soldier.

d. To assist the soldier in employing his leisure time profitably and to satisfy his intellectual interests.

This is an educational task of no mean proportions. Practically every unit in the Army contains men whose educational needs and desires vary widely. The illiterate must be taught to read, write, and figure (in fact, it is more profitable to the Army to teach him the three R's before giving him military training than to attempt to do both simultaneously). The man who needs a course at the Signal School for promotion must take a course in trigonometry in order to qualify for entrance. Hence the curriculum must contain many subjects and the opportunities for study must be available to every soldier.

The present organization of the Army Education Program fulfills these requirements. Its structure and operation can best be understood by examining the chart on page 35.

The USAFI

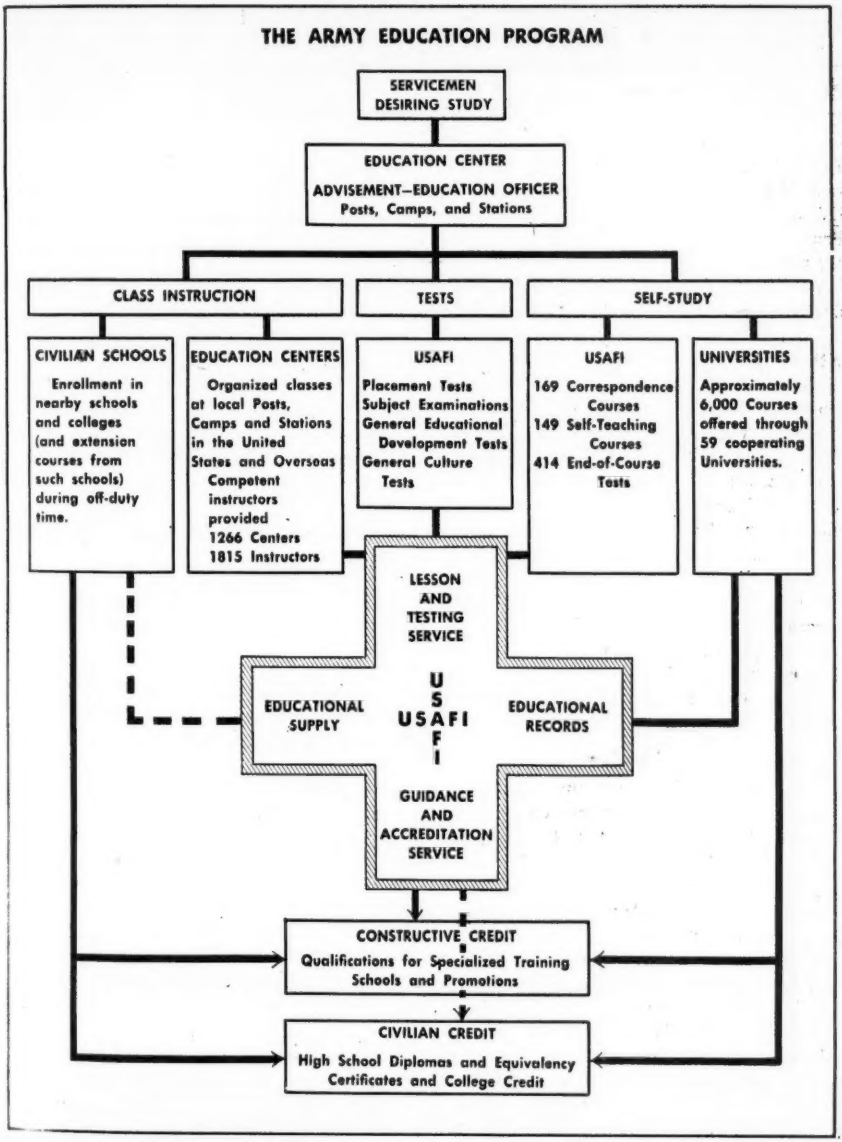
The dominant figure in this chart is USAFI, the abbreviation for the United States Armed Forces Institute. USAFI is the core of the education program. It is financed and operated jointly by the Army, Navy, and Air Force. Its headquarters is in Madison, Wisconsin, and there are eight overseas branches. USAFI procures and distributes all educational materials, including books for class study; provides lesson and testing service to individuals. It is a depository for all educational records, and furnishes guidance and accreditation service, including reports to civilian schools. In addition, the Institute performs many other functions which will be referred to in the description of the educational opportunities available through the program.

Education Center

Educational activity begins with the servicemen desiring study. The word desiring is used advisedly because participation in the program is voluntary and largely on off-duty time. Those who really want to study go to their Education Center.

This is the name we use to designate the installation which houses all educational activity. There is an Education Center at every post, camp and station in the Army and every base in the Air Force. The size and facilities of this center naturally depend upon the number of troops served. Some of these centers consist only of a few offices, a study hall, and one or two classrooms. Others consist of large buildings with laboratories, libraries, classrooms, auditoriums, etc. Here at this center is the Education Officer and, oftentimes, a civilian educator who helps in guiding the serviceman into the proper channel of the Education Program. There are three choices available to the prospective student. Self-study is available to every man in the Arm, Air Force, and Navy. He may pursue a correspondence or self-teaching course offered by USAFI, or he may take a correspondence course from any one of fifty-nine civilian universities under contract with USAFI. The offerings include academic, technical and vocational subjects on all levels from elementary through postgraduate.

If the educational background and experience of the soldier are such that the Education Officer considers it advisable for him to begin his study with tests, there are several types available. Placement tests evaluate a man's knowledge of the fundamental subjects, such as reading, writing, and arithmetic. Also, there are two General Educational Development (GED) Tests, one on the high school completion level and the other at the first-year college level. In addition, the General Culture Test is being used in the


THE ARMY EDUCATION PROGRAM
SERVICEMEN DESIRING STUDY
EDUCATION CENTER
ADVISEMENT—EDUCATION OFFICER
Posts, Camps, and Stations
CLASS INSTRUCTION
TESTS
SELF-STUDY
CIVILIAN SCHOOLS
Enrollment in nearby schools and colleges (and extension courses from such schools) during off-duty time.
EDUCATION CENTERS
Organized classes at local Posts, Camps and Stations in the United States and Overseas
Competent instructors provided
1266 Centers
1815 Instructors
USAFI
Placement Tests
Subject Examinations
General Educational Development Tests
General Culture Tests
USAFI
169 Correspondence Courses
149 Self-Teaching Courses
414 End-of-Course Tests
UNIVERSITIES
Approximately 6,000 Courses offered through 59 cooperating Universities.
LESSON AND TESTING SERVICE
EDUCATIONAL SUPPLY
USAFI
EDUCATIONAL RECORDS
GUIDANCE AND ACCREDITATION SERVICE
CONSTRUCTIVE CREDIT
Qualifications for Specialized Training Schools and Promotions
CIVILIAN CREDIT
High School Diplomas and Equivalency Certificates and College Credit

Army, and when successfully passed is accepted in lieu of two years of college.

Class instruction is available at many installations. There are group-study classes organized wherever possible, taught by military and civilian personnel. In the overseas theaters, the Army and Air Force furnish full-time civilian instructors. At the present time there are about 300 such instructors on duty with the Armed Forces teaching classes and grading papers in the theaters. In the United States there are very few full-time instructors; most of the teaching is done through a contractual agreement either with an individual instructor or with an institution. The majority of the classes are conducted at Education Centers under the supervision of Education Officers. However, many individuals attend extension classes of civilian schools. Some of these classes are held on the military reservation. As a matter of fact, right now there are several institutions which have established branches at nearby posts. The men attending and completing these classes are given residence credit at the institutions. For example, the University of Maryland has a branch in the Pentagon, and there were about 400 students in attendance last semester.

Large Enrollment

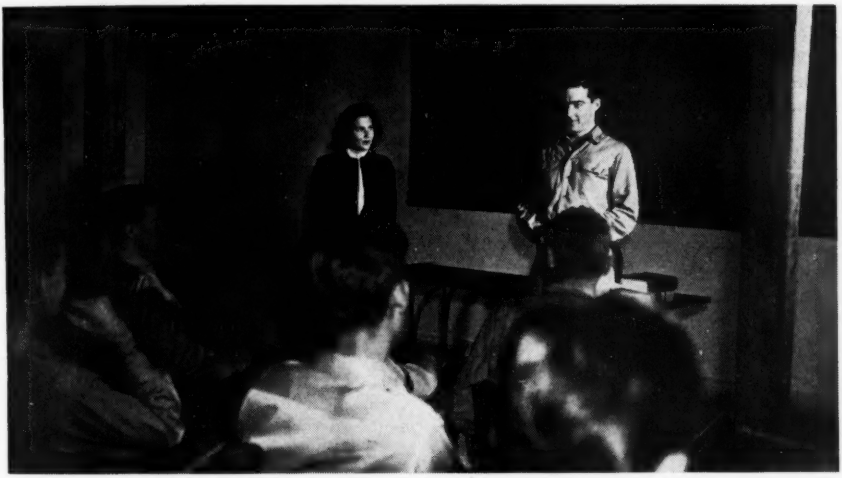
These opportunities are real and wide in scope and not just charts on a staff officer's wall. In the USAFI today there are enrolled 145,000 Army and Air Force personnel taking correspondence and self-teaching courses. In the university courses the active enrollment is 10,000. At the Education Centers throughout the world there are 60,000 men attending classes and, in addition, there are 5,000 attending civilian schools as individuals. In spite of the fact that the services have steadily decreased in strength over the past two and a half years, the activity in some phases of the Education Program has actually increased. This is indicative of the reality of the opportunities for education available to men in the service today. The figures above refer to enrollments, but the men are doing much more than just enrolling. The amount of time and effort being spent on courses and tests is impressive.

During the first quarter of 1948, 34,948 men in the Armed Forces took GED tests, each test requiring approximately ten hours. In the same period they completed 49,212 correspondence course lessons. Even more impressive is the activity in Headquarters, USAFI, which services only the Zone of the Interior. During the month of March 1948, this Headquarters enrolled 9,174 new students, processed and returned 15,093 correspondence course lessons, and corrected and reported 11,235 tests, including 9,713 GED tests. The corresponding figures for the Army and Air Force alone are 6,196 new enrollments, 10,602 lessons, 8,465 tests, including 7,285 GED tests.

Postwar Activity

This is indeed amazing in a force composed entirely of volunteers. It is true that during the recent war the Army established and maintained the largest adult education program in all history. Millions of men benefited directly and indirectly from the program offered during and following World War II. But it was feared by many that this program, so successful in a wartime force of draftees, would not be able to survive in a peacetime service of volunteers. However, what is happening today shows that these fears were groundless. As a matter of fact, the Education Program is in some ways stronger now than ever before in its history. Today one out of every four men is an active participant.

There are many reasons why so many men are studying. One lies in the fact that the commanders in the field believe in and support the Education Program. They encourage their men to study because



By means of the voluntary Army Educational Program, American soldiers are increasing their value to the Army and improving their personal opportunities through correspondence courses and study groups. Above, a public speaking class at the Infantry Center, Fort Benning, Georgia. Below, a radio construction class at Fort Bliss, Texas.

it means having men who understand their jobs and do them well; who prepare themselves for advancement and promotion, and set themselves goals for the future and work toward them, developing interests of a wholesome and constructive nature.

Contribution to Training

Education can now make a more direct contribution to military training than ever before. Weapons and tactics are becoming increasingly complicated. The illiterate must be taught to read, write, and figure before he can absorb basic military training. This was recognized during World War II, when the need for manpower was urgent, and Special Training Units were established to bring the illiterate up to a fourth grade knowledge of the three R's. But this is inadequate today, and many commanders are making concerted efforts to bring all of their men up to the eighth grade level in English and mathematics. The fourth grade man understands only a few hundred words; his vocabulary does not include many of the terms in the present curriculum. Moreover, there are mathematical concepts which are completely beyond his comprehension. In dealing with a group of men with an educational spread of eight or more grades the military instructor is faced with an almost impossible task. If he includes the definitions and explanations required by the lower group, he loses the attention of the others; if he does not, he simply bewilders, frustrates, and confuses the men in the lower group. And this lower group is not disappearing from the ranks. There are today several thousand illiterates and many, many more below the eighth grade level. Raising the educational level of these men pays immediate dividends in morale, efficiency, and time. According to psychologists, the average eighth grade man can be trained effectively in one-third the time required for the man who is barely literate. There is no phase of the Education Program which is more important to the commander than instruction on the elementary level (first through eighth grade). Classes should be organized wherever possible, because self-study is not generally productive at this stage.

A good education program means mentally alert soldiers. Through study the men not only acquire the background knowledge necessary to master the initiative skills of training more rapidly and thoroughly, but they also develop the logical processes required to solve problems which they have never seen before. And this is indeed vital in the light of present trends in tactics. The increasing isolation on the battlefield is going to leave the soldier more and more to his own devices—his contribution to the common effort will depend more upon his ability to think than upon his skill at imitating or his willingness to follow.

Study means a more understanding soldier—and hence one who has a sense of mission. A sword, no matter how keen its blade, is a menace to the enemy only when it is in the grip of a man with skill and determination. Skill is developed through training. Determination springs from a strong, driving belief in a cause. Such belief is the product of understanding gained through thought and study. It is the responsibility of the commander to foster this understanding in his men; to arm them with a thorough knowledge of sound governmental and ethical principles; and to equip them with a defense against false propaganda.

Educational Advantages

Another reason lies in the fact that all of this studying leads to constructive credits. As has been stated, promotion in the Army and Air Force now is based upon courses and tests, as well as upon service and experience. At certain stages the man is required to attend service schools. Most of these schools have academic prerequisites for entrance. For example, some require a high school di-

ploma or its equivalent; others require the completion of a specific course such as trigonometry or analytic geometry. Constructive credit for these requirements is obtained through participation in the Education Program.

Although USAFI courses carry no civilian credit, almost all of these courses are accepted at full value by most high schools and colleges and this means for the men in the service an opportunity to build up credit which will give them advanced standing upon separation from the service and matriculation at an educational institution.

Courses

With some 350 courses to choose from, it is interesting to note what subjects head the lists. The ten most popular correspondence course offerings in order are: Algebra I, Bookkeeping and Accounting I, American History, English I, Bookkeeping and Accounting II, Review Arithmetic, Gregg Shorthand I, Physics, English II, and Plane Geometry; all of these are high school courses. The most popular college subjects in order are: Algebra, Trigonometry, English Composition, and Accounting. In the technical category the order is Refrigeration, Plastics, Automotive Power Plants, Photography, Diesel Engines, and Aviation Engines. Of the men attending classes, 30 per cent are studying subjects in the field of business education; 14.7 per cent English; 14.5 per cent foreign languages; 12.5 per cent mathematics; 10.8 per cent trade subjects; 5.7 per cent natural sciences; 5.7 per cent literacy training; 3.5 per cent social sciences; and 3.3 per cent miscellany.

It is noteworthy that the men are choosing subjects which make them better citizens and better soldiers, and their wise choice is convincing testimony of the real, genuine value of the Education Program to the Army.

The British Army has established a similar program for its soldiers.* The possibilities and potential value of an Armed Forces educational program to the cultural and civic improvement of a nation are unlimited. Especially is this true of nations having a large percentage of illiterates and some form of compulsory military training. The youth of such a nation can synchronize their military training with educational instruction in the arts and sciences. Thus, not only will the nation improve the quality of its Armed Forces, but also the quality of its citizenry, the element upon which all human progress must eventually depend.

* For a discussion of this program see "Education in the British Army" by Major General Cyril Lloyd in the *Army Information Digest*, January 1948, pp. 26 to 30.

Jan 1949

Despite the opportunities for free education that exist in these United States, too many young men come into the Army appallingly ill-informed on the issues and crises that warrant their service. American education has failed to give many young men an alert appreciation of their liberties and a consequent explanation of their obligations. . . . We have neglected to tell them that democracy is a two-way street—that with its benefits comes the necessity for also giving service. It is because American education has so often failed to imprint this lesson of citizenship on the minds of these young men, that the United States Army has felt it necessary to stimulate their thinking while in the service.

General of the Army Omar N. Bradley

Use of 'Division Slice' Factors

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IN logistical planning, a preliminary estimate of the total size of a force is required to be able to foresee its final composition and size and to serve as a basis for initial estimation of required supplies and services. This is so because the required number of many service units such as hospitals, construction units, depot units, and maintenance units bears a direct relationship to the size of the total force, and because procurement of supplies and services must be initiated long before a final troop list is available.

Two factors are used conveniently in such planning, the "division slice" and "wing slice." The sum of the products of the division slice times the number of combat divisions in the force, and the wing slice times the number of wings in the force, equals the preliminary total of the force.

The division slice includes the strength of an average combat division, plus proportionate shares of the total corps, army, communications zone, and theater overhead units (plus Zone of Interior units for "worldwide slice" only) operating to the rear of the division. This is illustrated in Figure No. 1. We can see the division slice graphically in Figures No. 2, 3, and 4.

Figure No. 2 shows the general assignment of individuals within the various parts of the division slice.

Figure No. 3 represents a part of a theater of operations containing four divisions along the front, the corps area to their rear, the army area, and the communications zone. We find the division slice for the lower division by extending its lateral boundary to the rear, as in Figure No. 4, where this boundary has been extended through the division rear boundary, the corps rear boundary, army rear boundary, and through the sections of the communications zone, going all the way back to the theater rear boundary.

There may have been some question in the mind of the reader as to the use of any such concept as the division slice. We feel that these figures make clear that it is a very handy thing to have, for with it we can summarize the whole strength of a theater if we know the number of divisions within the theater. For example, if we have ten divisions in the theater, then the total strength of the theater is about 400,000 men of which about 100,000 will be in the communications zone, and about 170,000 assigned to the divisions, etc. It would seem to be a very handy concept to employ.

In planning the logistics of an operation, the use of division and air wing "slice" factors, explained graphically in this article, aids in the initial estimation of the supplies and the services required

Conversely, the division slice for any given force is equal to the total strength of the force, divided by the number of combat divisions in the force.

Similarly, the wing slice includes the strength of an average wing plus a proportionate share of the air force and army units engaged in developing or operating the air bases. It is shown graphically in Figure No. 5.

Relation between division slice and wing slice. During World War II each army division slice of about 40,000 men was balanced by two air force group slices (now wing slices) of about 5,000 men each. The 5,000-man group slice contained within itself about 1,000 communications zone men, indistinguishable from other army communication zone troops, who were present in the theater because of the air force which relied upon communications zone support. This same assumption is made throughout the text and charts of this article: the wing slice and not the division slice contains the communications zone support for Air. This allows troop planners to use these tables with varying ratios of air wings to army divisions in any specific force.

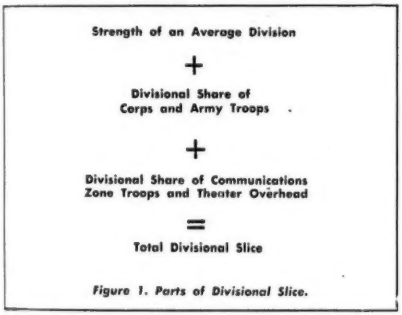


Figure 1. Parts of Divisional Slice.

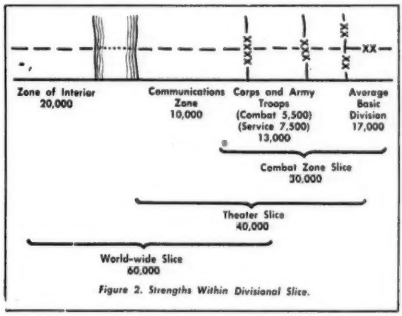

Zone of Interior 20,000
Communications Zone 10,000
Corps and Army Troops (Combat 5,500) (Service 7,500) 13,000
Average Basic Division 17,000
Combat Zone Slice 30,000
Theater Slice 40,000
World-wide Slice 60,000

Figure 2. Strengths Within Divisional Slice.

Basic slice factors are shown in tabular form both by assignment and by location in Figures No. 6 and 7.

Initially, in an amphibious assault, all elements are smaller than shown above and reach the strength shown there gradually during the build-up.

Percentage factors within the division slice. The table in Figure No. 8 presents the percentages of each arm, service, and other major grouping present in each part of a large balanced force. The table is based on the disposition of troops at the end of World War II at which time there were about ninety division slices in being. These figures have been modified to conform to postwar studies on the composition of the field army; the postwar divisions; the consolidation of all artillery in one arm; the consolidation of cavalry, armored, and tank destroyer units into one armored cavalry arm; the transfer of certain truck and car units from quartermaster to transportation corps; and the separation of the Air Force from the Army. The communications zone column does not include those Army communications zone troops who must be present to support the Air Force.

Percentage factors within the wing slice. The table in Figure No. 9 presents the percentages of component, branch, and major grouping present in the air strength of theaters of operations. It is based on disposition of troops at the end of World War II, at which time there were about 200 groups overseas. These figures have been modified to conform to current wing organization of the Air Force and to

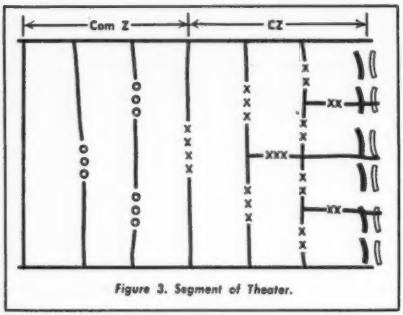


Figure 3. Segment of Theater.

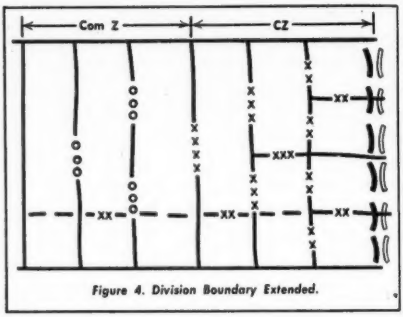


Figure 4. Division Boundary Extended.

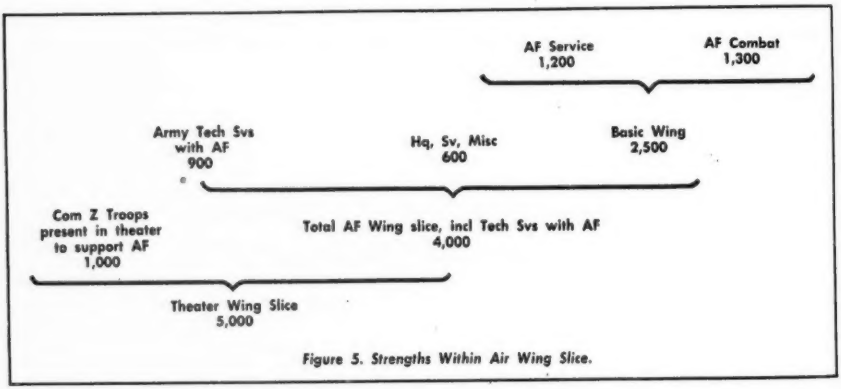


Figure 5. Strengths Within Air Wing Slice.

Composition of slice by assignment of troops			Per cent of slice		Composition of slice by location of troops	
Assignment		Troops			Troops	Location
Basic division		17,000	42	50	20,000	Division area
Corps and Army	Combat	5,500	14	25	10,000	Corps and Army rear areas
	Service	7,500	19			
Communications zone and theater overhead		10,000	25	25	10,000	Communications zone
TOTAL		40,000	100	100	40,000	All

Figure 6. Assignment and Location of Troops Within the Division Slice.

Composition of slice by assignment of troops		Per cent of slice		Composition of slice by location of troops	
Air Force Combat organization	2,500	50	0	0	Division area
Service organization (Air Force and Army service organizations with Air Force)	1,500	30	8	400	Corps and Army rear areas
Army communications zone troops	1,000	20	92	4,600	Communications zone
TOTAL	5,000	100	100	5,000	All

Figure 7. Assignment and Location of Troops Within Air Wing Slice.

DIVISION SLICE

Branch or other major groupings	World-wide slice		Theater slice (Army)		Combat zone slice (Army)		Division only
	Total (60,000) (men)	Z/I portion (20,000) (men)	Total (40,000) (men)	Com Z portion (10,000) (men)	Total (30,000) (men)	Corps and Army (rear portion) (13,000 men)	(17,000) (men)
Combat Division	28.3	0	42.5	0	56.7	0	100
Hq units, AG, FD, Sp Sv, and other administrative and intelligence services incl operating overheads, (including for Z/I defense command overheads and dept of army agencies)	5.4	9.5	3.3	9.0	1.4	3.2	0
Armd Cav	1.7	0.3	2.4	0.1	3.1	7.2	0
Arty	6.2	1.6	8.5	0.1	11.3	26.1	0
Cml	0.8	0.2	1.1	0.8	1.2	2.8	0
CE	7.8	4.0	9.7	12.9	8.7	20.0	0
MP	1.1	0.9	1.2	2.2	0.8	1.9	0
Inf	1.0	0.4	1.3	0.2	1.7	3.9	0
Med Dept	5.9	4.9	6.4	17.2	2.8	6.5	0
Ord Dept	3.8	1.8	4.8	7.4	3.9	9.0	0
QMC	4.4	2.6	5.3	15.8	1.8	4.2	0
SC	2.9	1.7	3.5	7.5	2.2	5.1	0
TC	5.8	5.0	6.2	17.4	2.4	5.5	0
Repls	10.2	23.0	3.8	9.4	2.0	4.6	0
Bulk Pers Z/I only	9.3	27.9	0	0	0	0	0
Misc Z/I only	5.4	16.2	0	0	0	0	0
Total percent	100	100	100	100	100	100	100
Per cent of world-wide slice	100	33.3	66.7	16.7	50	21.7	28.3
Per cent of theater slice	—	—	100	25	75	32.5	42.5
Per cent of combat zone slice	—	—	—	—	100	43.3	56.7

Figure 8. Percentages of Troops Within the Division Slice.

THEATER WING SLICE

	1	2	3	4	5	6	7
1	Component, branch, or other major grouping	Theater total 5,000 men	Army Com-Z in support of AF, Incl theater overhead 1,000 men [1]	AIR FORCE Total 4,000 men	Hq, Sv, and Misc 600 men (300 Hq and Misc) (300 Sv)	Tech Svs with AF 900 men [2]	BASIC WING 2,500 men (1,300 combat) (1,200 service) [3]
	AIR FORCE						
2	Hq and overhead	6.0		7.5	50 [4]		
3	Combat	26.0		32.5			52
4	Service-Dep	6.0		7.5	50 [3]		
5	Service-Fld	24.0		30.0			48
6	Theater and Com-Z Hq, Misc, and Overhead	3.1	10	1.3		6	
	TECHNICAL SERVICES						
7	Cml	0.9	2	0.7		3	
8	Engr	11.2	22	8.6		38	
9	Med	4.4	20	0.5		2	
10	Ord	2.6	5	2.0		9	
11	QM	5.4	16	2.7		12	
12	Sig	7.0	8	6.7		30	
13	Trans	3.4	17				
14	Total Per cent	100	100	100	100	100	100
15	Per cent of wing slice	100	20	80	12	18	50

[1] Army communications zone troops required in the theater due to presence of Air Force units requiring Army administrative support.

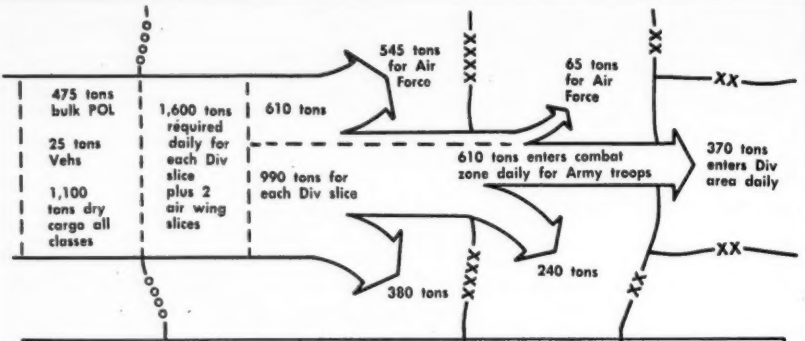
[2] Primarily construction, transportation, and maintenance units assigned to Air Force in the theater. Does not include medical troops organic to wing (only technical service so assigned).

[3] Located on the combat air field, includes all elements organic to wing.

[4] Includes various air headquarters, miscellaneous detachments, control and warning units, etc.

[5] Primarily Air Force depot troops.

Figure 9. Percentages of Troops Within the Air Wing Slice.


475 tons bulk POL
25 tons Vehs
1,100 tons dry cargo all classes
1,600 tons required daily for each Div slice plus 2 air wing slices
610 tons
545 tons for Air Force
65 tons for Air Force
610 tons enters combat zone daily for Army troops
370 tons enters Div area daily
990 tons for each Div slice
380 tons
240 tons
XXXX
XX
XX
XX

	Consumed per man in theater (Army plus Air)	Consumed by Army in theater, per Army man in theater	Consumed by Army in combat zone, per Army man in combat zone	Consumed by Army in division areas, per Army man in such areas
Bulk POL	19	10	9	5
Vehicles	1 (−)	1 (−)	1	1 (+)
Dry Cargo	44	39	31	31 (−)
TOTAL	64	50 (−)	41	37

Figure 10. Consumption of Supplies by Division Slice.

postwar studies on future logistical support of air operations.

Employment of these factors in making estimates allows the final troop strength to be approximated once the number of the division slices is determined. Further, the detailed percentages in Figure No. 8 allow strength by branch to be approximated in each major area. In addition, it is this slice concept from which initial estimates for expected expenditures of supplies are made. An example of such an estimate is shown in Figure No. 10. This type of estimated expenditure chart was covered in greater detail for each class of supply in the *December* issue of the MILITARY REVIEW in the article entitled, "Flow and Consumption of Supplies." The chart shown here in Figure No. 10 is a generalization of the data given in that article. It has, as did the charts in that article, its corresponding pound-per-man per-day factors keyed to each of the ton-per-division slice factors.

The impression may have been gained that logistical planning is easy. Unfortunately, this is not so. While certain data for outlining planning have been deduced from experience, each operation and each theater of war has to be studied individually before computations relative to future operations can even be commenced.

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The Offensive and Defensive Use of the Chemical Mortar Battalion

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Introduction

SINCE the close of World War II, many changes have been made and numerous others proposed for the improvement of the Army both from the viewpoint of its peacetime role and the role it must play in our national defense in the event of another emergency. Some of these changes are reflected in present tables of organization and equipment and in a re-evaluation of our matériel.

In this article we wish to consider the chemical mortar battalion as one of the many separate battalions of all arms and services which have been or are being re-evaluated by the Department of the Army. The re-evaluation of the chemical mortar battalion was dictated by experience in the use of this mortar battalion during World War II, and by publication of the policy, by the Department of the Army, that all explosive projectiles and weapons used by the Army are within the purview of the Ordnance Department.

On 31 December 1947, as a result of the above policy, the development, procurement, distribution, storage, maintenance and issue of the 4.2 inch chemical mortar and its ammunition became the responsibility of the Ordnance Department. However, the chemical mortar battalion remained as a Chemical Corps combat unit. In the new infantry division there is a heavy mortar company in each infantry regiment, which replaces the old cannon company. This mortar company will be equipped with eight 4.2 inch chemical mortars organized into two platoons of four mortars each.

The present concept of Army Field Forces is that the field army will have chemical mortar battalions assigned to it on the basis of one battalion per corps and one for the army. Thus, an army of three corps would have four chemical mortar battalions.

In light of the above, it is our intention to set forth a little background on the chemical mortar battalion, recommend a method for its offensive and defensive use and, lastly, to cite several historical examples from World War II which demonstrate that this battalion, when properly employed, is one of our most versatile and destructive units on the battlefield.

Relation of the Battalion to Chemical Warfare

For a better understanding of what follows let us review two quotations which establish the combat function of the Chemical Corps.

Chemical mortar battalions were used in every amphibious operation from Sicily on, and proved themselves, when properly employed, to be among the most versatile and destructive units on the battlefield

The National Defense Act of 1916, as amended, states that "The Chemical Warfare Service is charged with . . . the organization, equipment, training and operation of special gas troops, and such other duties as the President may from time to time prescribe."

The second quotation is from paragraph 68, FM 100-5, *Operations*: "Combat troops of the CWS engage directly in combat to assist other units of the field forces by the use of gas, smoke, incendiaries and high explosives. Chemical units are Theater of Operations forces. They are attached to armies and lower units as the situation requires. Chemical units may be employed profitably in mass for large scale gas operations or in small units for minor operations under the divisions or lower unit control. Normally, a chemical battalion is attached to a division and may in turn be broken down into a weapons company or platoon under infantry regiment or battalion control, firing high explosive concentrations to supplement artillery fire or to relieve artillery for other missions, and firing gas or smoke missions." This quotation sets forth Department of the Army doctrine.

If we tie these two statements together, we can arrive at one definite assumption: that is, that as long as the Chemical Corps is charged by law with the gas warfare mission it must have some nucleus of combat troops trained and equipped to perform that mission if called upon in a future war. The tactical unit designed for this purpose is the chemical mortar battalion, and the only standard weapon developed at the present time especially for laying down offensive gas is the 4.2 inch chemical mortar. Until some better weapon and organization is developed we must depend on the 4.2 inch chemical mortar and on the chemical battalions.

At the end of World War II many persons, even high commanders, stated that they saw no reason why the chemical battalion organization and the chemical mortar weapon should not be adopted in other combatant arms. Part of the answer to that argument now appears in the new infantry division with its company of eight 4.2s in each regiment. However, as long as the Chemical Corps is charged with gas warfare responsibility, it must retain the 4.2 inch mortar and the troops to man it until a more efficient weapon is developed to project offensive toxics.

The gas mission in World War II was never at issue and perhaps in the next war it may happen the same way, but the possibility of using gas will still be present. Hence, we must have means to use toxics efficiently. Offensive chemical warfare nearly always involves fairly large scale operations and requires the employment of at least a chemical battalion. Early in 1947 General Alden H. Waitt, Chief of the Chemical Corps, had this to say on the subject: "The adoption of the 4.2 in the infantry regiment is all very satisfactory if it does not cause the elimination of the battalion in the postwar organization. It is my contention that the Chemical Corps must have special units for the dissemination of non-persistent and even persistent gas and for large scale smoke screens. The artillery can't possibly fire any of the non-persistents which we have developed up to date because they can't lay down enough of the material in time. The 4.2 in the infantry regiment will be useless for any gas shoots because there will be no way of concentrating enough fire, and, further than that, the infantry commander is not going to be willing to give them up from their close support mission. Further, I maintain that planning for and tactical application of toxic agents is a specialist's job. They cannot be employed anywhere, anytime; they require a specialist's advice in the planning and firing. Similarly, coordination is required when any amount of

The firepower of the 4.2 mortar was utilized extensively in the European Theater during World War II. Above, a mortar crew of the 83d Chemical Mortar Battalion in action at Venafro, Italy, in December 1943. Below, another mortar crew firing the 4.2 at Bettendorf, Germany, in November 1944.

smoke is used. I am, therefore, continuing to maintain that chemical battalions are required, and I am inclined to believe that they should be army troops assigned on the basis of one per division." That stated the case most clearly. Since that time, the chemical mortar battalion has been definitely established as a responsibility of the Chemical Corps and has been provided for in the troop basis.

The development of any new weapon suitable for projection of toxics will, of necessity, have to be a multiple-purpose weapon similar to the 4.2. Requirements of a future war will not permit holding specially organized, trained and equipped units in reserve until that form of war of which such units are tailored becomes an actuality. Such was the case in World War II. It was not until the War Department approved the high explosives mission early in 1942 that the Chemical Corps was able to activate and train an initial nucleus of chemical mortar battalions for use in the different theaters. These comprised only six battalions, which were first employed in combat in the invasion of Sicily. The chemical battalion's usefulness and popularity grew by leaps and bounds, so that by the end of the war there were twenty-four battalions in all theaters. The Chinese likewise had organized 4.2 mortar regiments and even the Navy was using them to play little brother to their 16-inch guns.

The 4.2 in the Infantry Division

What brought about the adoption of the 4.2 in the infantry regiment? It is felt that this resulted from the fact that the infantry had found they needed a heavy weapon in the cannon company of greater all-around usefulness than the M-2 howitzer. From the viewpoint of versatility, a heavy mortar fitted in best. In addition, the infantry had learned the tremendous effectiveness of screening smoke when employed properly and laid down by a unit equipped with the right weapon and an efficient and effective shell.

Another consideration, it is felt, was the desire of the infantry to have a weapon in the cannon company which could go with them wherever they might be called. Wherever human feet and hands can walk or climb with carried loads, there the 4.2 mortar can likewise be found.

Organization of Battalion

The new infantry heavy mortar company should satisfy any future division commander as far as heavy mortar support for his infantry regiments is concerned. If that be so, then we can explore the possibilities for using the chemical mortar battalion other than in the decentralized role we found so wide-spread in the last war. If we accept that our postwar army will contain some of these battalions, and that in our mobilization for any war of the foreseeable future we must provide a reasonable proportion of such units in the troop basis, it may be well to investigate some of the possible uses for such a battalion.

Before taking up its tactical employment we should like to touch upon the battalion's organization and equipment. In this we point to the future. We do not foresee any major change in the present organization of a headquarters and headquarters company and three weapons companies, with three platoons of four mortars each. The primary transport for all fighting elements is the quarter-ton jeep and trailer. There is a certain number of 2½-ton trucks in the battalion but these are administrative vehicles, the main part of which comprise the ammunition train of three sections of three trucks each. Each of these sections is designed to support one weapons company.

This organization was found to be quite satisfactory in the last war, even though the T/O&E's provided only the minimum manpower and vehicles to accomplish the various missions. The most serious defi-

One of the important characteristics of the 4.2 mortar as demonstrated in World War II, was its versatility. Above, a mortar crew is firing one of three mortars mounted on the deck of an LCI (M) in the Pacific Theater. Below, a crew of the 82d Chemical Mortar Battalion firing the 4.2 from the jungle on Arundel Island in September 1943.

ciency was found in the unit's vulnerability to ground attack from infiltrating elements. Employment close-in behind our infantry found the mortars lacking in personnel to establish a close-in defense. It was very often necessary to call upon the infantry to give this protection. Even with this help personnel in these units often found themselves engaged in the infantry fight in order to save their own skins.

Comparison of Fire Power

What fire power has the infantry added to its supporting fires by the adoption of this weapon? To answer this we should like to draw a comparison between this mortar and the 105-mm howitzer simply because the latter is the weapon closest to this mortar in caliber. Let us look at Table No. 1.

	Wt. of Proj.	*Wt. of HE*	*Rate of Fire*		*Range*	*No. of Weapons in battalion*
			Rapid	*Sustained*		
4.2" mortar	25 lb.	6.8 lbs	20 rpm	5 rpm	675-6,000	36
105-mm howitzer	33 lb.	3.9 lbs	5 rpm	1-2 rpm	1,000-12,000	12

Firing one minute on one target by entire battalion:
One 4.2 battalion: $36 \times 20 \times 6.8 = 6{,}420$ lbs. HE or 2.448 tons.
One 105-mm battalion: $12 \times 5 \times 3.9 = 234$ lbs. HE or .117 tons.

$$\frac{2.448}{.117} = 20 + \text{times as much HE by 4.2 as by 105-mm or one battalion of 4.2s has the shock action of 20 battalions of 105-mm.}$$

Table No. 1.

We believe that this comparison vividly illustrates the tremendous fire power of this unit, and explains why the infantry put this weapon in its regiments.

Employment of the Battalion

Now that we have a fair idea of the mortar battalion organization and its fire capabilities, how are we to use it or, more properly, how might we use it most efficiently? We have previously given the number of these units we had in World War II. They were used in many ways. Their attachments were many and varied. They fought under every army. Practically every corps at one time or another had one or more of these units. These corps, with one exception, used the battalion in one of two ways: attached entirely to one division, or split up between two or more divisions. One battalion at one time was split between two corps of two different armies. XIX Corps used a different method; it attached the battalion to its Corps Artillery.

The mortar battalion also became part of special forces. One battalion fought with the Ranger Force in Sicily and Italy; part of it with the Commandos in Italy. A company from each of two battalions was transported by glider to Southern France. Last, but not least, the Navy used the 4.2s in their mortar gunboats. The battalions supported all kinds of units in all kinds of terrain and in all kinds of weather, with eminent success.

In its tactical employment, the first point to remember is that the mortar battalion is so equipped and armed that it is well-adapted to any type of combat operation, but particularly to amphibious

or airborne assault, and mountain or jungle operations. In any operation where the artillery cannot be brought in early, or where the tough going prevents heavier caliber weapons from staying up, this battalion can be called on to give the infantry the needed fire support.

As in the last war, these mortar battalions should be theater troops and should be assigned to armies. The army should then attach them to its corps. In World War II this ran to about one per corps, which is in accordance with present concept.

Now, we feel that the corps commander should keep a very close string on this battalion and, in nearly all cases, dictate its employment so that it may most materially aid the accomplishment of the corps mission.

In a corps attack, the battalion should be employed behind the division that is making the main effort, just as the bulk of the corps artillery is employed. If, as in some situations, the corps attack is a general push all along the line, then the battalion should be used to help the division which has the most difficult task to perform.

In normal defensive operations, the battalion should be used with covering forces or outposts to cover critical areas denied to our artillery, or to reinforce or cover gaps in our belt of defensive fires. The unit should also be kept in mind as a powerful support to our counterattacking force unless the battalion is otherwise committed and cannot be shifted.

In both offensive and defensive operations, fire plans should be coordinated with the infantry heavy mortar companies and with the corps and division artillery.

In the event of gas warfare, large-scale gas shoots such as can be put down by one or more of these battalions will have to be controlled at corps or army level and will be fired under the direct order of the corps or army commander.

There will be some situations where the battalion may be used for large-scale smoke operations. Depending on weather conditions, the battalion can screen anywhere from 1,200 to 14,000 yards and maintain the screen as long as desired.

To assist the corps effort, the corps staff should be resourceful in its use of smoke. We are convinced that many hard-won successes would have been much less costly if more frequent and efficient screening had been employed. All theaters were guilty of insufficient use of smoke, but we believe the Pacific was less so than the others. The ETO was particularly delinquent. With proper weather conditions and all factors being equal, the attack of any type of position without maximum judicious use of smoke is reprehensible and unpardonable. It is inconceivable that any commander should fail to take advantage of reducing the effectiveness of the enemy's aimed fire to one-fourth.

We find the mortar battalion particularly useful in special operations. For amphibious operations, we have a unit so equipped that it can be sent ashore in small boats or DUKWs in about the sixth or seventh wave. Its close fire support is available as soon as the mortars can open fire at their minimum range of 675 yards. The battalion will do yeoman work until the artillery comes ashore. In such operations, mortar units can be used liberally and early.

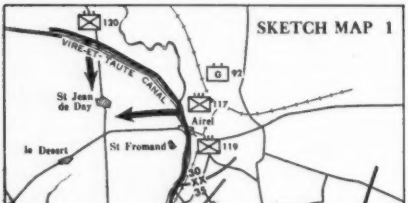
For airborne operations, the unit is ideal. It can be parachuted in with the earliest elements. The 75-mm pack howitzer cannot equal this mortar for close support. The mortar is infinitely easier to man-handle, but the ammunition does present a larger problem.

As regards mountain operations, as we said before, wherever men and animals can walk or climb carrying loads, these mortars can go. Pack boards for mules are standard equipment. Here again, ammunition presents a considerable problem,

due to its bulk and weight. To offset this disadvantage, you have a weapon which can place fire on any terrain except the steepest reverse slopes.

In the jungle we find close combat highlighted, and mortars of any kind are extremely effective and welcome. Accuracy is at a premium and a knockout punch is needed at short, close-in ranges. Further, a weapon which can go where a man or animal can break a trail is most welcome.

As for Arctic warfare, we see no serious disadvantages in the employment of the



mortar battalion. Our Arctic testing program will give us the answers as to the changes made necessary in manning tables or equipment due to the extreme weather encountered.

Historical Examples

To illustrate these comments, we should like to give a few historical examples of what may be considered the proper future use of this mortar battalion.

The first example is the use of the battalion in offensive operations, the combat action of the 92d Chemical Mortar Battalion from 6 to 17 July 1944. This battalion was used all through World War II in much the same fashion as we visualize these units should be used in the next. Initially, this Battalion was attached to XIX Corps, which, in turn, attached it to its corps artillery. The Corps Commander gave the Corps Artillery Commander absolute authority over the employment of the battalion to include instructions to division commanders on how to use the outfit even though the battalion may have been attached to the division. The Battalion was always placed behind the Corps main effort and the Corps Artillery Commander always made sure the Battalion was used as he thought best.

The XIX Corps Artillery Commander was a great believer in the rolling barrage, properly controlled and properly followed; hence, nearly every division attack in this corps, which was supported by the 92d Battalion, found the Battalion firing such a barrage in front of the regiment making the main effort. This method may be considered wasteful of ammunition, but it brought excellent results.

By late June 1944, plans were laid in First Army for certain operations to straighten out our lines and enlarge our beachhead in Normandy in order to secure sufficient maneuver room for the early breakout and push to the south and east. Since St. Lô was to be the hinge for this breakout, it was necessary to capture St. Lô and widen the Carentan corridor which linked the Omaha and Utah beachheads. This job fell to XIX Corps in conjunction with VII and VIII Corps to the west of the Vire River.

The XIX Corps plan was in two phases. The 30th Infantry Division was to attack first across the Vire River and the Vire et Taute Canal to secure a firm operating base to the west and south thereof, respectively. Then the 29th and 35th Infantry Divisions were to attack to the south to capture St. Lô, with the 30th Division west of the Vire attacking south in con-

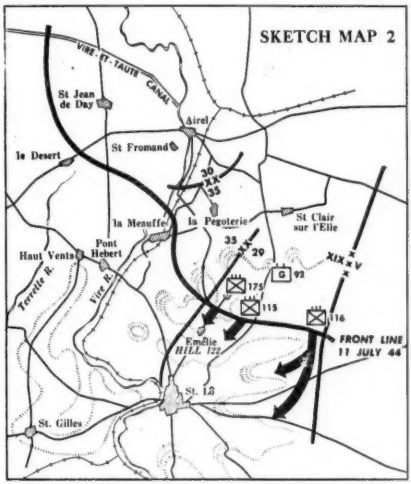
junction with the 3d Armored Division (Sketch Map 1).

The bulk of the Corps Artillery, to include the 92d Chemical Mortar Battalion, was put behind the 30th Division for its crossing. The Battalion was attached to the 30th Division and assigned the mission by the Division Artillery of firing initial preparation fires, and at the jump-off, to fire a controlled barrage 800 yards in width to progress to a depth of 1,200 yards, the fire to be stepped forward in 100 yard increments. The lifting of the fire was to be controlled by the infantry, one round of WP signifying that the fire was being lifted. Complete communications with the infantry and artillery were set up. Incidentally, this was to be the first combat action of the 92d Battalion.

The barrage was established in front of the 117th Infantry, which was making the main effort (Sketch Map 1). The regiment jumped off at 0500, 6 July, in column of battalions. The crossing was accomplished on time even though heavy enemy shelling impeded efforts to get the bridges across. The infantry followed the barrage very closely, some elements within seventy-five yards. Progress was steady but slow, because of the German hedgerow defenses. The battalion expended 3,550 rounds of HE and WP. The 117th stated that the barrage was most successful in keeping their casualties low and helping them in their attack.

By 1430, the 117th was 400 yards from its final objective, the main crossroad one mile south of St. Jean de Daye. The 120th Infantry on the north, had jumped off at 1345 and aided by the attack of the 117th made steady progress so that by 2200 the 30th Division's bridgehead was firmly established. The subsequent advance to the south by the 30th Division spearheaded the advance of the XIX and VII Corps.

Let us now switch to the attack on 11 July by the 29th Infantry Division to encircle St. Lô (Sketch Map 2). The 92d Chemical Mortar Battalion was put behind this division. However, its barrage was placed in front of the 115th, the center regiment, instead of the 116th on the left, which was making the main effort. True to form, at 0030 the night before the attack, the Germans launched a strong combat patrol with strong artillery preparation. This was launched through the gap between the 116th and 115th and caused considerable confusion.



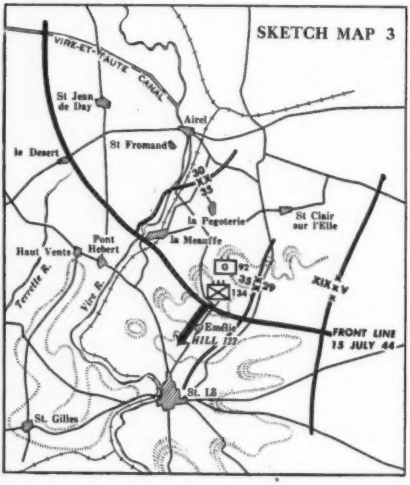
Because of this and the poor coordination between the artillery and infantry, the 92d had to start its rolling barrage twice before the infantry jumped off. Finally the infantry did get going, and the Battalion gave the three regiments close support until nightfall on the 13th, when the 29th Division arrived on all its objectives. The first day 5,777 rounds were fired and 2,923 and 2,048 rounds on the two succeeding days.

Now let us see what happened to the 35th Infantry Division, which had relieved elements of the 29th Division due

north of St. Lô and west to the Vire River on 9 July (Sketch Map 2).

This division had attacked in conjunction with the 29th on 11 July. Its objective was the north bank of the Vire west of St. Lô. Good progress had been made on the 11th, but on the 12th, the advance did not exceed 200-300 yards. On the 13th the Division regrouped, and on the 14th the 137th Infantry on the right made a small advance.

This same day the 134th Infantry was put in the line on the left, relieving



the 2d Battalion, 115th Infantry, 29th Division (Sketch Map 3). This extended the 35th zone to Highway GC 6. The 134th was given the mission of attacking at 0515, 15 July, to capture Hill 122, which was the key to the defense of St. Lô. The 92d Chemical Mortar Battalion was now put behind this regiment.

The fire support plan was completely coordinated and means of controlling it were flexible and complete. The Battalion took part in the preparation fires, and then, in conjunction with Division artillery, fired a 500 yard-wide rolling barrage along the road leading from Villers-Fossard to Hill 122. The 134th Infantry, jumping off at 0515, progressed well and by 2100 had captured and dug in on the north crest of Hill 122. In fourteen hours the 92d Battalion fired 6,959 rounds of HE and WP.

On the 16th, the mortar companies were attached to the infantry regiments, and for the next two days assisted them in taking all assigned objectives. On the 20th, the 35th and 29th Divisions completed the capture and occupation of St. Lô.

On 15 July, the 30th Division, across the Vire, had reached its assigned objective of St. Gilles and then found itself placed under VII Corps which controlled the 9th Division on the right of the 30th Division.

With some small advances along the XIX and VII Corps fronts, the preliminary seizure of the necessary ground was complete for the beginning of Operation *Cobra*.

No small part of the success of these operations was due to the manner in which the 92d Battalion was employed behind each of those divisions moving decisively against determined dug-in enemy defenses in exceedingly difficult terrain.

Other such battalion actions, to mention a few, were the breaching of the Siegfried Line and the crossings of the Roer and Rhine Rivers by XIX Corps. Incidentally, all of these actions were spearheaded by the 30th Infantry Division. We should like at this point to touch on the defensive use of the chemical mortar battalion. In the corps it should normally be given to the unit which has the most difficult defensive job. This is particularly so where operations are over rugged terrain. The unit should not be parcelled out just to have it in the line. The defense is an excellent time to permit this unit to get needed rest and rehabilitation. That this is necessary is attested by the fact that the 83d Chemical Mortar Battalion, through 450 days of combat in Sicily, Italy, France and Ger-

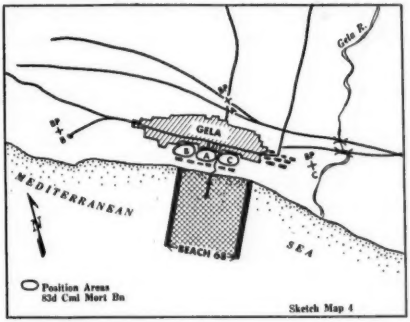
many, suffered more than 1,800 casualties, which represents nearly 300 per cent turnover.

Another example of a unit in action is one of the earliest major offensive actions of World War II, the invasion of Sicily on 10 July 1943. The Ranger Force of approximately regimental size was attached to the 1st Infantry Division with the mission of capturing Gela, reducing its defenses, destroying the coast artillery on the high ground northwest of Gela, and protecting the left flank of the 1st Division (Sketch Map 4). To assist in this job the Force was given the 83d Chemical Mortar Battalion, less one company (the battalion had four companies of twelve mortars each at this time). The principal mission of the Battalion was to assist in the defense of the Gela perimeter after its capture. Since Gela sits on a promontory about 150 feet high, overlooking the Mediterranean on the south and the Gela plain on the north, it was necessary to have a heavy weapon that could cover in close to the beach, a minimum range of about 700 yards. This was an area which naval gunfire could not touch, and which the artillery of the 1st Division further to the east could only cover to a limited degree. Holding Gela was vital to insure the successful landing of the entire 1st Division and, three days later, the 2d Armored Division.

The entire scheme proceeded according to plan. The German and Italian reaction developed as expected. The enemy counterattacks were smashed before they got within 2,000 yards of our position. One Italian light tank attack got into Gela before it was destroyed. One German tank counterattack got into Gela before it was destroyed. One German tank counterattack ran through the 1st Division position before being knocked out. This tank attack came as far to the west as the Gela River before it turned back from the WP screen which the 4.2 mortars placed in front of it.

Despite touch and go for two days, the beachhead was secured the third day and the remainder of the story is well known. Other notable defensive uses were the 83d's employment in the Salerno and Anzio operations in Italy, and the 92d's employment under the 78th Infantry Division in helping to hold the northern shoulder in the Battle of the Bulge.

Mortar battalions participated in every army amphibious operation, in all theaters, from the Sicilian Invasion on. In Italy, they shared the hardships of cold mountain warfare, and, in the Pacific, they stood



Sketch Map 4

the test of the tropics and the jungle. Above all, the invasion of Southern France proved their feasibility as airborne troops.

Conclusion

In all of this varied history, the mortar's use was essentially by company, but in many, many cases a more efficient use would have been by battalion massed fire to support the initial attack, and then to have followed this by breakdown of companies to support the attacking regiments.

In conclusion, we should like to reiterate that with these mortars in the new infantry division, and with the premise that our future wartime army must have a certain nucleus of these units, we shall have ready at hand a battalion which, if properly handled, can be one of the most versatile and destructive units on the battlefield.

Observing Personnel Management at Work

Lieutenant Colonel Charles D. Colman, *Field Artillery*
Former Instructor, Command and General Staff College

Introduction

THE Department of Personnel of the Command and General Staff College has for one of its basic premises the principle that the success of any command, whether in the combat area or not, depends greatly on that type of personnel management which makes a complete and efficient use of manpower. The department uses the word "management" in the modern sense, which emphasizes, with due regard for the basic and essential military discipline requirements, those phases of psychology which apply to human relations, leadership, classification and assignment, promotion, work adjustment, and morale.

During World War II, the army's manpower problem was always of critical importance. The military manpower problem was, and still is "big business." With this in mind, and in line with Department of the Army directives, industry's latest personnel management procedures and techniques are under continuous study by the Department of Personnel.

The common course of instruction which is presented to the entire class of the Command and General Staff College emphasizes those personnel procedures and functions applicable to units in the combat zone, the communications zone, and the zone of the interior. Personnel problems arising in special operations, or due to new weapons, are studied in the latter part of the course. Considerable time is devoted to the application of basic personnel management principles to concrete military situations.

Students of the Department of Personnel further analyze modern methods of personnel management during the specialized phase of instruction. The applicatory portion of the specialized instruction in personnel management is further emphasized by a course designated as "Observation and Reports." The purpose of this article is to discuss this final course in personnel management.

The purpose of the course on Observation and Reports is to provide further instruction for the students in the Department of Personnel by enabling a group of students to visit an industrial o business installation where they become acquainted with and are given an opportunity to observe the methods pertaining to personnel administration, personnel management, leadership and other personnel activities. These visits are so organized as to afford each student an opportunity to compare the personnel policies and procedures of industry with those used in the United States Army, and then to make recommendations for the improvement of the Army personnel management policies and procedures, and of the instruction in those subjects as presented by the Department of Personnel.

In the student analysis of industrial procedures in personnel management and their comparison with army personnel management procedures, students are in-

structed to keep in mind the objectives of personnel management in the industry. These objectives are, first, to increase the effectiveness of the working force individually and as a team, and second, to increase the satisfaction and well-being of the individual.

The Detailed Program

The course in Observation and Report was given an allocation of forty hours (one week) during the 1947-1948 class. At the request of the Director of the Department of Personnel, the Chamber of Commerce of Kansas City suggested certain representative industries for student visits. All arrangements were made with industries approximately six weeks prior to the scheduled course. These arrangements included initial contact with industrial leaders by the Department Director, a conference on the program by the instructor responsible for the course, and a final meeting with plant personnel participating in the program, at which both the course instructor and the faculty advisor for the group to visit the industry, were present.

The program for the week's instruction was divided into five phases. Phase I, Orientation and Trips, utilized fourteen hours. An orientation was given all students on the Friday afternoon prior to the visits on Monday and Tuesday. Administrative details were given by the instructor in charge and the student body of approximately one hundred officers was divided into ten committees, with a chairman for each committee designated. Copies of the industrial programs and a very comprehensive questionnaire entitled "Personnel Practices in Business Organization" were issued to each student. The main headings of the questionnaire included:

I—The Industry—General (Organization, industrial relations).
II—Organization of Personnel Department.
III—Functions of the Personnel Department.
IV—Employment (Procurement).
V—Maintenance of Employees (Training, general).
VI—Employee Training (Training, incentives, separations, etc.).
VII—Maintenance of Work Environment.
VIII—Service Functions.
IX—Public Relations.

The questionnaire, although quite inclusive in nature, was not designed for use at any one industry but rather as a guide for the use of all students.

The military manpower problem remains a "big business" in the Army, as a result of which students of the Department of Personnel study the personnel procedures of selected industries in a special course

After the general orientation, each committee met with its designated faculty advisor, and was briefed on the particular program to be presented by the industry which the committee was to visit.

On Monday and Tuesday, the following representative industries or plants within the greater Kansas City area were visited:

Ford Motor Company, Kansas City Public Service Company, Swift & Company, Transcontinental & Western Air, Inc., General Motors Corporation, Sheffield Steel Corporation, Southwestern Bell Telephone Company, Hall Brothers, Inc., and the Kansas City Power and Light Company.

Phase II, Individual Reports, was allocated two hours on Wednesday morning.

On the basis of the prepared industries program and the main divisions of the

questionnaire, each committee chairman allocated specific areas or fields for each committee member to investigate and report on at the plant visited. These individual reports were prepared in class on Wednesday. One copy was turned in to the Director of the Department of Personnel and one copy was given to the committee chairman for his use in the preparation of a committee report. These reports represented individual student work. At the completion of the individual reports the balance of Wednesday morning was utilized in the organization of each committee for a committee report.

Phase III, Seminar Instruction in Personnel Management, was conducted on Wednesday afternoon.

To enable the Department of Personnel students the opportunity to supplement the instruction given by industry and to more adequately correlate previous personnel management instruction given in the specialized personnel course, a series of seminar instructional groups was arranged. Chancellor Deane W. Mallott of Kansas University, Lawrence, Kansas, made available to the Department the services of outstanding authorities in the fields of personnel management. Under Dean F. T. Stockton, the class was divided into six seminar groups and rotated to each professor for a brief discussion in accordance with the following program:

Seminar on Human Relations.

Seminar on Psychology of Leadership and Motivation.

Seminar on Interest and Personality Inventories and Counseling (Director of Guidance Bureau).

Seminar on Proficiency and Aptitude Tests (University Extension Representative).

Seminar on Job Analysis and Job Evaluation (Professor of Industrial Management).

Seminar on Selection and Training of Industrial Supervisors (Professor of Personnel Management).

At the conclusion of the seminar groups, and open forum under the direction of Dean F. T. Stockton was held, with the entire student body participating in a discussion on general problems.

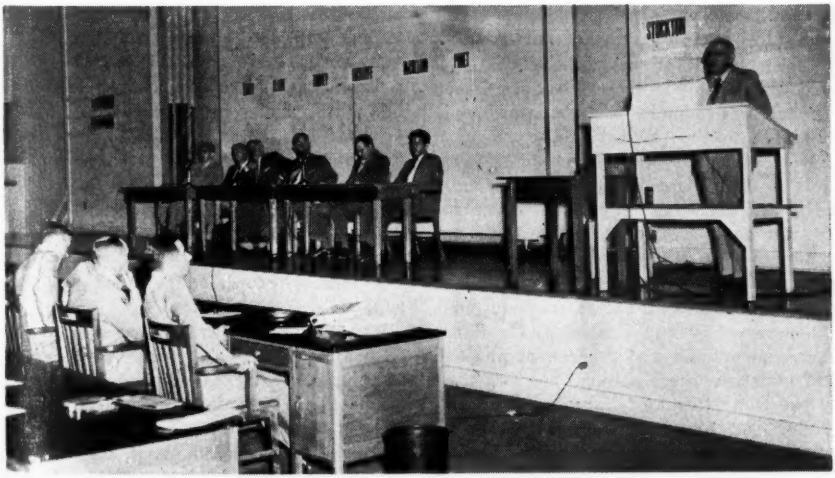
Phase IV consisted of the preparation of committee reports. On Thursday, each committee, under the direction of the Committee Chairman, prepared a group report in the form of a formal staff study. Time was allocated in the evening for student rehearsals for a committee oral report on Friday.

Under Phase V, oral presentations were scheduled for Friday with one representative from each committee presenting a twenty minute report of the committee's findings at the industry visited. At the completion of the oral report to the class, the entire committee acting as a panel discussion group and seated on the platform answered class questions on their particular report. During this discussion period of approximately fifteen minutes, each student who was responsible for a particular phase of the report answered the questions in his particular field.

At the conclusion of the oral reports, the Director of the Department of Personnel conducted a brief critique of the student reports and summarized the class findings on business personnel practices. This summary included a comparison of business practices with personnel policies and procedures, and recommendations for improvement of present Army procedures based on the student reports.

The program above outlined for the course in Observation and Reports is not a new instructional method in the army educational system. The modification and implementation of this type of instruction can be of the greatest value to groups of officers in other schools of the Army, and

Student committee seminars and open forum discussions, with civilian educators, make up another part of the study of personnel management at the Command and General Staff College. Above, a seminar on personality inventories and counseling. Below, a forum on personnel problems, with Dean F. T. Stockton, Kansas University, as chairman.



to individual officers interested in a study of personnel management.

Results of Industrial Trips

Before considering the purely personnel management aspects of this course, the author wishes to bring out these two points—first, that educational and industrial leaders gave their whole hearted cooperation; second, that the press gave understanding and excellent publicity. The first of these results became apparent when working out the individual programs to be presented by each industry. Industrial leaders evidenced vital concern for the Army, indicated that they were very proud of the Army and therefore gave willingly of their valuable time to assist its officers. From a public relations viewpoint, the exchange of views and the mutual understanding achieved as a result of the officer visits was of tremendous value. Not only did officers broaden their viewpoint on business practices, problems and procedures, but all of the industrial leaders participating indicated that they had a better understanding of the Army's problems.

The second result was an implementation of the Army's policy of keeping the public informed on Army activities.

Close coordination with educational leaders also had a two-fold effect. First, the latest academic thought was made available to the student officers. Second, the discussion of present personnel problems of the Army in the light of more advanced thinking gave the educators a better understanding of Army problems.

As a result of their visits to industry and the seminars with educational leaders, the student groups made recommendations for improvements in United States Army personnel policies and procedures and the instruction in these subjects as presented by the Department of Personnel. All the groups felt that current instruction in personnel management was adequate, and that the trips to industries should be continued. A few of the recommendations for improvement in United States Army personnel policies and procedures are listed below.

"Decentralization and on-the-job training should be intensified in the Army, in order to save manpower."

"The Army 'suggestion' plan should be given more publicity; it is felt that such a plan might help save time and supplies, improve equipment and perfect procedures; all of which result in dollar savings."

"Provide personalized individual testing in peacetime rather than group testing."

"Provide Army recruiting agencies with a means of maintaining closer contact with the vocational guidance officials in schools and colleges; especially provide high school councillors with literature pointing out the advantages and prestige of the Army as a career."

"That greater emphasis be placed on the indoctrination of junior leaders in current policies and procedures, so that enlisted personnel can discuss the same intelligently with squad and platoon leaders; it is felt that such knowledge on the part of the junior leader would assist materially in creating and maintaining the correct attitude in the recruit."

"That the public relations value of the individual soldier be stressed."

"That better family morale of enlisted personnel be developed."

"That periodic interviews between the individual soldier, his commander and personnel officer be scheduled at least four times during the year to review the individual's records, duties and progress made."

"That qualified civilian guest speakers be utilized for both on-duty and off-duty training and educational programs."

The above sampling of student recommendations shows the stimulating effect of this integrated industrial, educational, and Army course of instruction.

Students of the Department of Personnel study personnel problems in various industries to get a better understanding of the Army's problems. Above, a student committee listens to an official of the Kansas City Power and Light Company. Below, another committee observing management methods at Swift & Company, Kansas City, Kansas.

Summary

This type of instruction can be utilized by all Army schools teaching personnel management. The results of such instruction not only assist and broaden the viewpoint of the Army officer, but acquaint industrial and educational leaders with Army procedures, techniques and problems. In a time of national emergency, many officers, especially officers of the administrative and technical services, must work with leaders of industry and education. The knowledge derived from this type of instuction assists in the preparation of these officers for such an emergency.

As a result of this instruction both students and instructors felt that the Army is doing a more-than-creditable job in its handling of personnel. However, the Army must continually strive to improve its handling of personnel and its instruction in personnel management. The scheduling of a part of the practical applicatory instruction in personnal management, in cooperation with industrial concerns and educational institutions, will insure that student officers have a comprehensive and progressive viewpoint on personnel procedures and techniques.

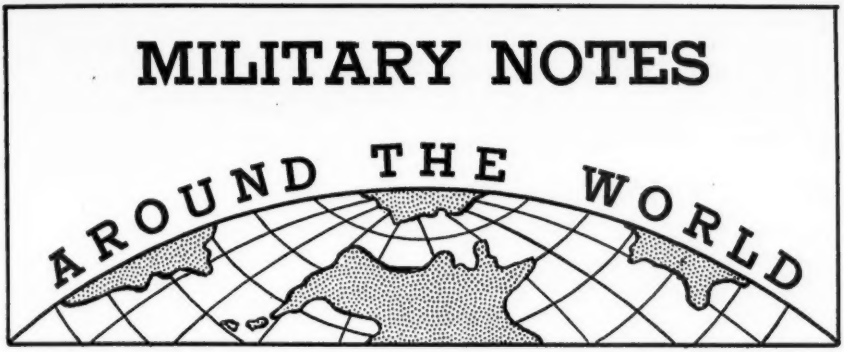
It is the people that make the Army and its Department. The success of both can be largely measured by the intelligence and spirit and general effectiveness of their personnel. The backbone of our Department is the soldiers and civilian employees who man the weapons and the supply lines, and who in headquarters and in offices turn the needed wheels of a great organizational machine.

Secretary of the Army Kenneth C. Royall

The most important and vital weapon in the hands of any country at war is its fighting man.

Brigadier E. H. A. J. O'Donnell, Great Britain

MILITARY NOTES



AUSTRALIA

Extracting Uranium Ore

Uranium ore fields in South Australia are proving more extensive than early reports indicated. At East Mount Painter, a large amount of ore has been taken out for assay. Work is being hastened by the installation of a new plant, including air compressors. At Radium Hill, to the southeast, four lodes are clearly defined. Samples from eleven holes at Radium Hill have proved richer than any discovered so far at East Mount Painter. Mount Painter is in the Flinders Range about 450 miles north of Adelaide.—*Australian Weekly Review.*

COLOMBIA

Visiting Officers

During a recent tour of military installations in the United States, a party of officers of the Colombian Army, headed by General Miguel Sanjuán, Chief of Staff of the Colombian Army, visited the Command and General Staff College and the editorial offices of the MILITARY REVIEW. Besides General Sanjuán, the party included General Francisco Tamayo, Colombian Military Attaché at Washington; Lt. Col. Guillermo Otálora, Purchasing Agent for the Colombian Army and a student at the College in 1947; and Major Iván Berrio J., Chief of the Presidential Guard, Bogotá.

CANADA

US-Canadian Defense

The United States and Canada pledged continued cooperation on defense following recent discussions in Ottawa. The conferences attended by the defense chiefs of the two countries dealt mainly with joint action in any future emergency, with top priority given to three projects:

1. The role of Canadian manufacturing plants and raw materials in any military emergency.

2. Interchange of weapons and ammunition among the armed forces of Canada, the United Kingdom, and the United States.

3. Standardization of United States and Canadian arms and ammunition.—*The New York Times.*

NEW ZEALAND

Scientific Defense

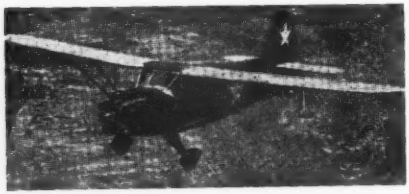
In accordance with a government proposal of a scientific arm of the defense forces, an advisory committee has been appointed, consisting of several professors with notable records on defense projects during the war, and leading scientists from the government.

The function of the committee will be to advise the Defense Council and the Chiefs of Staff on scientific questions, and research and development that can be undertaken.—*The New York Times.*

USSR

New Soviet Plane

Information pertaining to Soviet military planes indicates progress along the



Yakovlev Yak-14.

lines of that being made by other world powers. The Yakovlev Yak-14 is a small, high-wing liaison plane recently introduced into Soviet aviation. It is equipped with an M-11, 145 hp. radial motor and has a maximum speed of 200 km/hr., with a range of 1,000 km.—*Mondaéro.*

SWITZERLAND

Airplane Procurement

The Swiss have acquired from Allied surpluses a number of relatively modern fighter aircraft in good condition which will bridge the gap until the delivery of *Vampire* jet planes.—*Flugwehr und Technik,* Switzerland.

THE NETHERLANDS

Fokker Airplane

The second new Fokker airplane designed and built in Holland since World

War II is the S-11 two seat training plane.—*The Aeroplane Spotter.*

ARGENTINA

Gunnery Course

The United States Army Caribbean recently conducted a gunnery course for a group of officers and noncommissioned officers from the Republic of Argentina. Locale of the special school was the 65th Antiaircraft Artillery Group at Fort Amador, Canal Zone.

For a period of three months the Argentine students studied the mathematics of artillery fire and the intricacies of electronic fire-control. An intensive course in English was included in the curriculum to enable the Spanish-speaking students to receive technical instruction in the original language.

Included in the artillery course were most of the training aids common to US Army classes. Liberal use was made of training films and combat documentaries. The films were particularly helpful in language training and in pointing up the practical aspects of artillery in combat.—US Army Caribbean.

WESTERN EUROPE

Defense Union

Implementing the Brussels Alliance, the defense ministers of Great Britain, France, Belgium, The Netherlands and Luxemburg met recently and agreed on common measures against aggression. They set up a permanent international command under a permanent military chairman.

Field Marshal Viscount Montgomery of Great Britain has been designated chairman. Under him are French General Jean de Lattre de Tassigny to command the land forces, British Air Marshal Sir James Robb to head the air forces, and French Vice Admiral Robert Jaujard to command the combined Western fleets.

The military chairman is not a supreme tactical commander as such. He will head the supreme planning staff and will coordinate the over-all strategy of the countries involved.—News reports.

GERMANY

Multiple Chamber Cannon

A multiple combustion chamber cannon constructed by the Germans for firing on London from the French channel coast, was designed to fire a projectile 2.5 meters long. The projectile was stabilized by fins, had a diameter of fifteen centimeters, and weighed seventy kilograms. It is obvious that the effects that could be expected from the few kilograms of explosive carried were ridiculously small. Nevertheless, a fixed battery of five tubes was under construction on the rear side of the cliffs in the Calais area, in a trench with a fixed incline of 50°.

The guns consisted of forty tubular sections of about two meters in length joined end to end, provided with twenty-eight lateral powder chambers in which the charge was ignited at the moment the projectile passed. The latter was finally expelled at a muzzle velocity of 1,500 meters per second.

The designer was well satisfied with the tests, although once out of every three times some irregularity in the successive firings caused the explosion of one section of the tube which, however, could be replaced quite quickly.

The RAF settled the issue as to the effectiveness of the weapon by destroying the installation in a bombing attack before the first shot had been fired.—*L'Armée Française.*

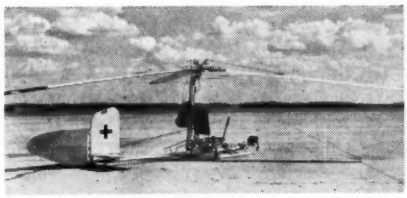
Scrap Metals

United States Army authorities in Heidelberg, Germany, stated that a proposal covering sale of 75,000 tons of ferrous scrap comprising demilitarized combat vehicles and 5,000 tons of secondary aluminum ingots was issued in March. Bids were publicly opened in Heidelberg on 10 May 1948. All material sold under this proposal must be returned to the United States for use in the US economy.—Department of the Army.

"Kite" Helicopter

One of the oddest German developments of World War II, a "kite" helicopter that was towed behind a submarine, is being tested for the US Air Force by the Cal-Aero Technical Institute, Los Angeles, Calif.

The small craft consists only of an open-air seat on a single piece of tubing, below a three-bladed rotor that is turned by a relative wind of seventeen knots or more. The speed of the submarine, combined usually with a light-to-strong breeze, was enough to lift the Nazi "kite" off a U-boat's deck once the blades had been given initial rotation by a hand crank. Then the helicopter soared upward in back of the boat, carrying its single passenger to heights of 500 to 1,000 feet. The submarine could be contacted by telephone, and safety features included a device that would break away the rotors and spring open a parachute for pilot and "fuselage." In case of danger to the boat, the observer could be cut loose by the submarines.



Motorless helicopter which was used to extend the range of vision of German submarines.—US Air Force photo.

The kite can be knocked down to a compact package and stored in the submarine. Helicopter pilots find it easy to fly, and it is believed that several crew members on each submarine were capable of operating the aircraft.—*American Helicopter.*

GREAT BRITAIN

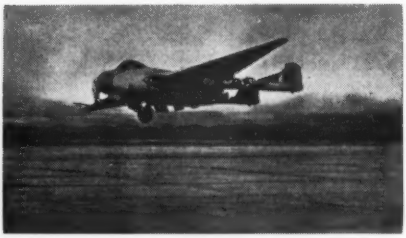
New Motor Torpedo Boat

The British have launched a motor torpedo boat which is constructed of aluminum-alloy metal rather than steel. The new vessel weighs only one-third that of its World War II counterpart. Tests are being conducted to determine the feasibility of using light metal in this type craft and are expected to reveal that the vessel will be capable of increased speed, increased range, and able to carry greater armament.—*The Sphere*, London.

Aluminum-alloy motor torpedo boat.

New Altitude Record

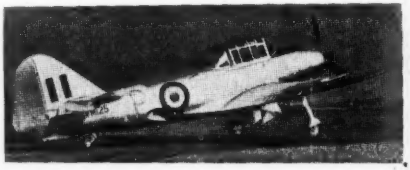
RAF de Havilland Vampire jet fighter plane with increased wing spread and a special engine was recently flown to a new world altitude record of 59,492 feet, more than 3,000 feet higher than an Italian plane in 1938.—*The Sphere.*



Landing after 47 minutes high flying.

Prop-Jet Trainer

This is the Auro Athena powered by an Armstrong Siddeley Mamba. It is the first British trainer to have a prop-jet engine. —*The Aeroplane.*



"Clear Air Gusts"

Two British *Mosquito* planes, flying European air routes, have started an investigation aimed at making travel in jet airliners safe and comfortable.

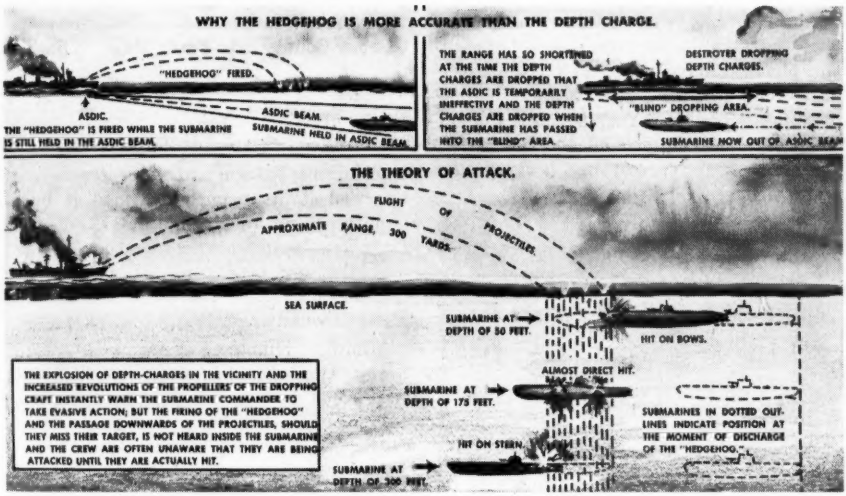
Working with a few scientists, the pilots are seeking ways of tackling a mystery of high-altitude flying, the "clear air gusts." These are areas of violently turbulent atmosphere at heights between 20,000 and 40,000 feet. Since jet airliners must fly at such altitudes to operate efficiently, a solution to the problem is vital for the comfort of travelers of the future.

So far little is known about the causes and frequency of the clear air gusts except that they may be connected with temperature changes.

The technique is to fly in a "saw tooth" pattern, alternately climbing to 40,000 and descending to 20,000 feet, taking readings of turbulence and temperature at 5,000-foot intervals.

As soon as a turbulent region is encountered, the saw-tooth pattern is abandoned and the depth, area and local temperature gradient of the disturbance are systematically explored. The researchers hope to be able to gather all the information needed in eighteen months.—*The New York Times.*

"Hedgehog": Submarine Killer


WHY THE HEDGEHOG IS MORE ACCURATE THAN THE DEPTH CHARGE.
"HEDGEHOG" FIRED.
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THE "HEDGEHOG" IS FIRED WHILE THE SUBMARINE IS STILL HELD IN THE ASDIC BEAM.
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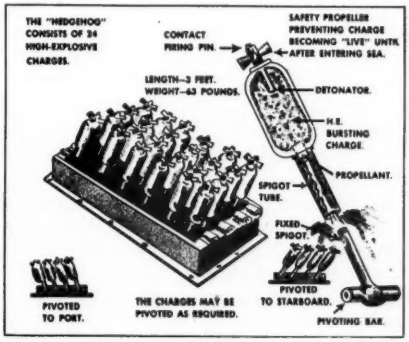
DESTROYER DROPPING DEPTH CHARGES.
"BLIND" DROPPING AREA.
SUBMARINE NOW OUT OF ASDIC BEAM
THE THEORY OF ATTACK.
FLIGHT OF PROJECTILES.
APPROXIMATE RANGE, 300 YARDS.
SEA SURFACE.
SUBMARINE AT DEPTH OF 50 FEET.
HIT ON BOWS.
ALMOST DIRECT HIT.
SUBMARINE AT DEPTH OF 175 FEET.
SUBMARINES IN DOTTED OUTLINES INDICATE POSITION AT THE MOMENT OF DISCHARGE OF THE "HEDGEHOG."
HIT ON STERN.
SUBMARINE AT DEPTH OF 300 FEET.
THE EXPLOSION OF DEPTH-CHARGES IN THE VICINITY AND THE INCREASED REVOLUTIONS OF THE PROPELLERS OF THE DROPPING CRAFT INSTANTLY WARN THE SUBMARINE COMMANDER TO TAKE EVASIVE ACTION; BUT THE FIRING OF THE "HEDGEHOG" AND THE PASSAGE DOWNWARDS OF THE PROJECTILES, SHOULD THEY MISS THEIR TARGET, IS NOT HEARD INSIDE THE SUBMARINE AND THE CREW ARE OFTEN UNAWARE THAT THEY ARE BEING ATTACKED UNTIL THEY ARE ACTUALLY HIT.

Method of attacking submarine with "Hedgehog" high explosive charges.

Specially designed to take advantage of the virtues of the Asdic, the Royal Navy's submarine-spotting device, is the "Hedgehog." This, one of the Navy's most jealously-guarded weapons and only recently taken off the secret list, is essentially a battery of twenty-five spigot mortars. The range of the weapon is about 300 yards and the twenty-five projectiles are discharged over a period of two seconds. This, together with the fact that some are very slightly pivoted from the central line of fire, causes the projectiles to enter the water in a circle, thus extending the area of effectiveness. This attack is more effective than the depth-charge attack, as in the latter the enemy submarine is no longer in the Asdic beam. With the "Hedgehog," the enemy is attacked while still "held in the sights," and the submarine commander has not had the warning of an acceleration in the attacker's speed, which is inevitable with a depth-charge attack. Furthermore, the "Hedgehog" projectile explodes only on impact



"Hedgehog" antisubmarine weapon.

and so the submarine crew's first knowledge of attack is usually the fatal explosion.—*The Illustrated London News.*

UNITED STATES

Survival-Ration Test

Eleven Army volunteers ended a five-week survival-ration test recently without physical harm. Through their sacrifice—some lost up to thirty-one pounds in weight—the New York Medical College Research Unit decided on the best minimum ration for preserving body tissues under distress conditions.

The ration that gave the highest efficiency with the least drain on body working tissue was a daily diet of about six ounces of protein-packed biscuit, and three and one-third eight-ounce glasses (800 cubic centimeters) of water, supplemented by a multi-vitamin tablet and a fixed unit of salt. The proportions of the biscuit ingredients were not disclosed at request of the Army Quartermaster.

Twenty soldiers of the Third Armored Division, Fort Knox, started the test on 12 May. Ten went the full time. The others dropped out during the course of the test, some for medical reasons, others because a particular test they were concerned with was completed, and one to go on an emergency furlough.

Each day each soldier ate twenty-eight of the gumdrop-sized, brittle, brown secret-formula biscuits, or seven at each of four meals. The vitamin tablet was served at breakfast. The men were kept beyond sight or smell of cooked food. Their activity was not limited. They played table-tennis, watched television, listened to the radio, sunned on the beach and did a lot of reading—all of it on the light side. Toward the end they spent more and more time reading.

The test director pointed out that beyond the military advantages—saving shipwrecked service men cut off from food supply—the test findings should advance the study of weight-reducing diets, relief feeding of masses of population now on inadequate diets, and in handling post-operative cases.—*The New York Times.*

Weather Reporting

The Air Weather Service Detachment at Clinton County Air Force Base, Wilmington, Ohio, has tracked a balloon carrying weather apparatus (radiosonde) at a height of 112,800 feet.

The crew assigned to the ascension tracked the balloon on radar scopes and recorded its transmissions until it burst upon reaching an altitude of 112,800 feet. Only one other higher weather balloon ascension had been recorded, that one being 120,000 feet at the White Sands, New Mexico, weather station.

Weather balloon ascensions are made every four hours at every one of twenty Air Force weather stations, and the balloon carries aloft with it a radio transmitter which sends signals to a ground recorder. Temperature, humidity, and pressure readings are recorded at various heights. This information, sent in code, is mechanically entered in another piece of equipment on the ground which de-codes the information and automatically records it on paper. Wind directions are noted at various levels and recorded.—Department of the Air Force.

New Technical Units

Two new committees have been set up in the Research and Development Board.

One is the Synthetic Analysis Committee, which will examine all aspects of military activity, such as supply, transportation, stockpiling, troop movements and combat operations, to ascertain where scientific methods—particularly those using high-speed computers—can be utilized to improve existing procedures.

The other group is the Committee on Technical Information, established to promote effective exchange of research and development information among the departments of the National Military Establishment.—*Armed Force.*

Service Functions Clarified

The top commands of the Army, Air Force and Navy not only have a clearer understanding of their spheres of authority and responsibility, following the conference of the Joint Chiefs of Staff with the Secretary of Defense in Newport, R.I. recently, but they also have started passing the word down the line for inter-service harmony.

Announcements left no misunderstanding that the Air Force's main function is strategic air warfare, but "this does not preclude participation of other services." Likewise, the Navy is assigned the job of anti-submarine warfare; but it is understood that the Navy is "to invite all the help it can get from the Air Forces in carrying out this mission."—*Army Times.*

Air Defense Reorganized

The US Air Force's Air Defense Command has been reorganized, reducing its six air forces to four, with the First Air Force absorbing the area formerly comprising the Eleventh, and the Fourteenth Air Force expanding to include the Tenth Air Force area. The Tenth Air Force designation has been transferred to the Second Air Force area. The Second and Eleventh Air Forces have ceased to exist. The Fourth Air Force, embracing the eight far western states, was not affected. The object of the reorganization was to establish the most effective air defense for continental United States.—Department of the Air Force.

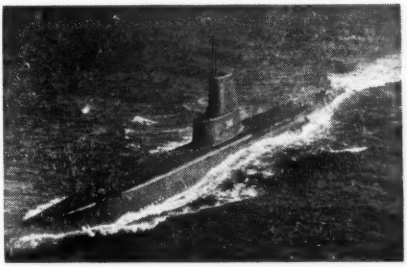
Synthetic Fuel Survey

The Chief of Engineers has announced the award of a $110,000 contract which initiates a nationwide survey for the Department of the Interior as a part of the latter's program to procure the basic data necessary for the planning of synthetic fuel manufacturing plants.—*Ordnance.*

Modernizing Submarines

The Navy is engaged in a project involving major modification of existing submarines to enable them to operate submerged for indefinite periods at periscope depth, and to step up underwater speeds to sixteen knots and above.

Major modifications include removal of deck armament, streamlining, installation



USS *Corporal.*—US Navy photo.

of "schnorkels" or underwater breathing tubes, and increases in battery capacity.—*The New York Times.*

Officer Schooling

The urgent need for officers to train men in the enlarged Army has delayed advanced schooling of more than 250 officers.

About 25 per cent of the officers previously selected to take up courses in five Army schools have been ordered to command and administrative duties in connection with the expanded military forces.

Schools chiefly affected were the Command and General Staff College, The Ground General School, The Infantry School, The Artillery School, and The Armored School.

It is anticipated that the officers who have been diverted from school this year will be given the opportunity to enroll later in view of the great importance the Army attaches to its military education system.—News reports.

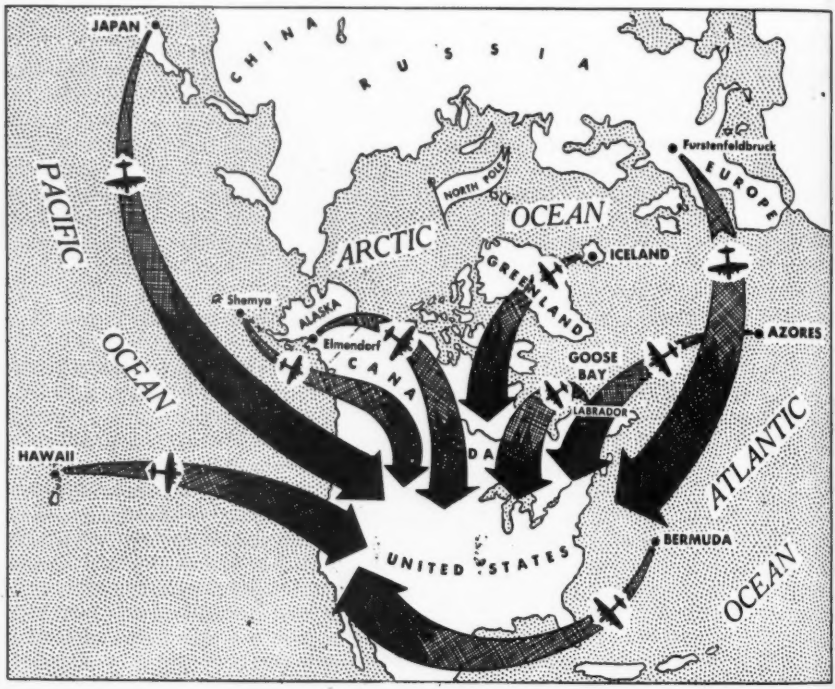
B-29 Demonstration

To show the ease with which invading bombers could converge on any point in the United States, the Air Force, as part of its Air Force Day observance, flew fifty B-29s to "targets" in the United States from nine distant "enemy" bases.

Twenty-five flights of two Boeing B-29

The planes took off from Anchorage, Alaska; Terceira Island, the Azores; Barbers Point, Hawaii; Keflavik, Iceland; Goose Bay, Labrador; Shemya, Aleutian Islands; St. George, Bermuda; Misawa, Japan; and Furstenfeldbruck, Germany.

Destinations included Montgomery, Ala-



Routes flown by "attacking" B-29s.

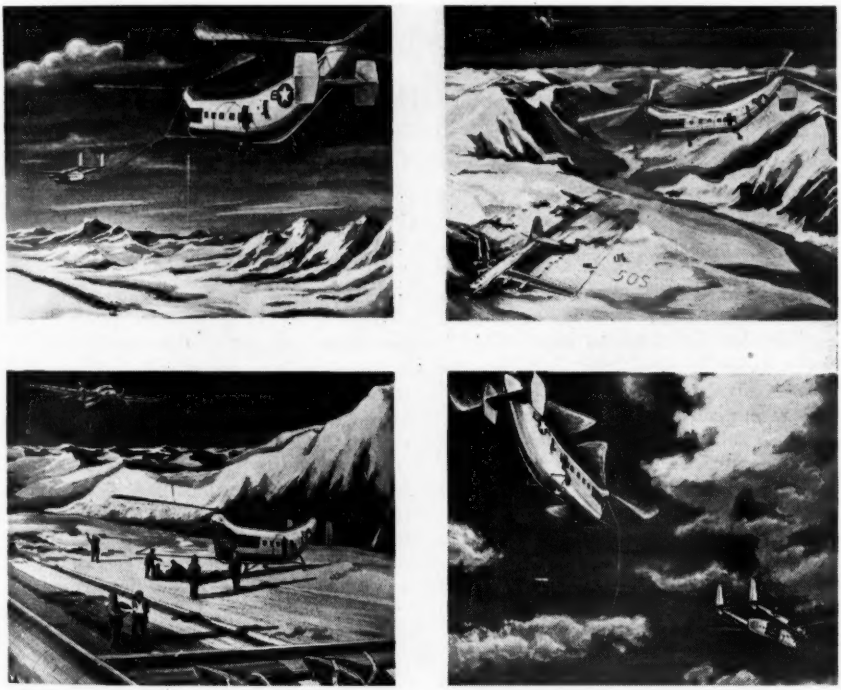
Superfortresses participated in the operational flights from overseas bases to destinations in the United States. All the flights were non-stop, ranging from 3,800 to 5,600 miles, and terminated at their announced destination at noon, on Saturday, 18 September. Each was considered strategically "on target" if they arrived within an hour of the estimated time.

bama; Birmingham; San Antonio, Texas; Charleston, West Virginia; Milwaukee; Cleveland; St. Louis; Omaha; Cincinnati; New Orleans; Buffalo; Chicago; Pittsburgh; Dallas; Boise, Idaho; San Rafael, California; Los Angeles; Riverside, California; New York; Boston; Washington; Detroit; Seattle; Minneapolis; and Baltimore.—*Armed Force.*

New Air-Rescue Technique

Arctic rescue, because of cold, remoteness and inaccessibility, is always extremely difficult using conventional means. A new technique now being tested involves the use of a transport helicopter being towed to the scene of a crash, thus increasing its range. On arrival within 100 miles of the scene of the crash, the helicopter might shuttle the injured to the mother ship before hooking on for the flight home.

With this new method, rescues can be effected limited only by the range of the tow plane. A spot a thousand miles



Top left, the helicopter being towed to the scene of the crash; top right, descending vertically to the wreckage; bottom left, loading the injured personnel aboard; bottom right, helicopter "hooking on" to transport aircraft in midair after rising from the ground under its own power.

it will be cut loose to land under its own power, pick up the survivors, take off and again make contact with a tow plane for the return to the operating base. If the tow plane is able to land or more from a base in the United States can be reached by the tow technique.

The USAF's Air Matériel Command is now conducting tests on towing helicopters.—Piasecki Helicopter Corp.

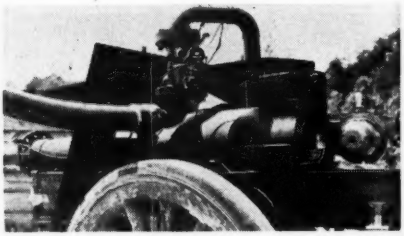
Air Gun For Testing Bombs

The Chemical Corps has devised an air gun for projecting small bombs against a target, to test performances without dropping them from an airplane.

A nest of three tubes of varying diameters and eighteen feet long is inserted into the barrel of a 155-mm howitzer. The tubes extend inward as far as the firing compartment of the howitzer. Air seals are provided for each size tube. When a larger tube is used, the next smaller tube or tubes are removed.

A gasoline-driven air compressor, capable of delivering air at pressures up to 800 pounds per square inch and two air receivers, are provided. Air from the receivers is conducted to the firing compartment of the howitzer by a 3-inch pipe, fitted with a solenoid-operated valve. The bomb to be tested is placed in the tube of appropriate size; a wooden driving disc, to which is attached a leather obturating cup (to prevent escape of compressed air), is inserted in the tube behind the bomb; the breech compartment is closed and air admitted by closing the electrical circuit operating the solenoid valve. As the bomb leaves the muzzle it breaks a wire on the solenoid circuit and causes the air valve to close.

Air gun with pressure tank.



Closeup showing solenoid switch.

Velocities are measured by two wire screens, separated by a known distance, placed in the path of the bomb. At each screen the bomb breaks an electrical circuit and causes a spark puncture on a revolving chronograph. The distance between punctures is readily converted into seconds of time and thence into bomb velocities .—*Armed Forces Chemical Journal;* Chemical Warfare Service photos.

Submarines Launch Missiles

Guided missiles were launched from the submarines *Ponidon* and *Diodon* during recent maneuvers off the California coast. Targets for the missiles included surface vessels as well as shore positions. Operating under simulated battle conditions, the two high speed submarines demonstrated their effectiveness in this new phase of naval warfare. Missiles were launched while the submarines were surfaced.—*Marine Corps Gazette.*

USAF Airmen

In the future all enlisted personnel of the United States Air Force, both male and female, will be referred to as "airmen".

The redesignation is in line with the Army's use of "soldier" and the Navy's use of "seaman" for enlisted personnel.

The term, "airman," however, will not change the use of the standard "enlisted man" in orders and official publications. —*Army and Navy Journal.*

The Aerial Battle

Translated and digested by the MILITARY REVIEW from an article by General Gerardot in "Revue de Défense Nationale" (France) May 1948.

It has been long thought that the new air force would have its own rules of employment and that the great principles of war would not apply to it because of its technical character or because it was regarded as a force which would work with and for the ground forces.

World War II has shown how erroneous were the opinions generally held by military leaders before that war. Now it is recognized that there is an aerial war, just as there are naval and land wars. Their relationship is extremely close, even greater than formerly existed between land and naval wars. Aerial warfare is now a reality, and it is found to be guided by the great principles of war.

One of those principles is to seek combat. Without victory, no force can perform the role for which it exists. Only a naval victory will permit the free sailing of friendly military fleets. Only a land victory will permit an army to occupy enemy territory, which is an essential goal of war. Finally, only an aerial victory will permit the air force to have freedom of the sky, whether friendly or enemy. Without such freedom, the air arm cannot protect friendly territory, nor can it attack enemy territory, nor help the land and naval forces in executing their missions.

Land and sea forces have had their doctrinarians who could cite past examples to demonstrate the necessity for battle, a necessary prelude to all definite action of the armed forces. It was difficult for those who wished to take the air force seriously and to study its doctrine to base their opinions on past wars. It was therefore difficult to establish air doctrine, and when it was attempted, such individuals were considered visionaries.

Was it visionary or was it the result of experiences of World War I which lead Marshal Fayolle, inspector of aviation after that war, to write in 1922, in his *Historical Study of the Employment of Combat Aviation in Some Operations in 1918*, the following lines? "The part pertaining to each specialty of aviation in the general reserve will be determined according to the following objectives which are to be attained: first to obtain aerial superiority, the role for the fighter and bomber force; afterwards, to be able to exploit as must as possible that superiority in order to take action against the ground objectives (bomber force)."

Air Superiority

Among those principles which seem to

have been drawn from Douhet, and which probably preceded him, is this: There is a single essential mission for fighter aircraft—to command the sky over the battle zone and to bar it from the enemy. All other missions are secondary, since they are assured as soon as the former is accomplished.

Why is it that the ideas of a great leader of ground forces, expressed satisfactorily in 1922 and proved in World War II, are accepted today by very few leaders of the ground arms? Undoubtedly it is because we do not have leaders who have conducted military operations on a sufficiently high level, nor leaders who have lived through the battle for air supremacy as did Montgomery and Eisenhower. Fayolle, on the other hand, went through World War I in a position of high command, and observed that each time a battle was launched without air supremacy there was failure.

Each time the Allies of World War I engaged in ground battle while possessing air superiority, successes resulted.

From that impressive parallel of air superiority and ground success (confirmed in World War II), Fayolle concluded that it was first necessary to achieve air superiority, which can be acquired only through air battle. That doctrine was never taken seriously in the French Army.

This same battle was waged abroad, particularly in Italy, under the direction of Douhet. After much effort, he succeeded in making his voice heard. He knew how to apply to the air force the great principles of warfare. In regard to air battle, he says: "The only objective of aerial warfare is freedom of the air. When freedom of the air is obtained, the air forces should be employed against ground elements in order to break the moral and material resistance of the enemy. The nation that holds the freedom of the skies saves its territory and its waters from air attacks, while the territory and the waters of the enemy remain subject to those attacks without the possibility of effective counterattack. The air force should then answer two conditions in order to become an essential factor for victory: be qualified to win the battle for the freedom of the sky, and be qualified, after having won the freedom of the sky, to exploit it with forces capable of bringing about the breakdown of the material and moral resistance of the enemy."

To these arguments, the French military high command, and even the air command, remained indifferent. To apply to the air force the principles which formed the basis for action by the land and naval forces, implied placing the air force in the same category as the land and naval forces. Fayolle and Douhet were ignored or considered visionary.

The individuals who knew how to put into practice the classical theories of Fayolle and of Douhet were the English and American air leaders of World War II. The principal one was, perhaps, General Carl Spaatz, Chief of the United States Army Air Force in Europe, who, with Tedder and Harris, was the victor in the aerial battle for Germany.

General Spaatz demonstrated that the air battle was the necessary and indispensable prelude to the operations for which the air forces are intended.

Douhet and Fayolle were right. The great principles of war are applicable to aviation as well as to naval and land forces, as demonstrated in World War II.

Preparation for War

It is necessary not only to win the air battle but to be *ready* to engage in that battle. Theorists have never stressed *preparation* sufficiently.

As regards preparation, Clausewitz wrote that modern warfare derives from the ideas of Napoleon, who was the first to stress the importance of preparation, and the great power of mass multiplied

by movement for breaking the moral and material forces of the enemy in battle.

Unfortunately, Foch, who quotes that phrase of Clausewitz, limits the meaning of preparation. Preparation, to Foch, was concerned solely with mobilization and concentration of forces, for he assumed *a priori* that armies are ready to wage war. That is undoubtedly a great error, the principal error of our military thought before 1914 and before 1939. The error has been to believe that our army was ready when it was not.

The preparation, which should come as a prelude to putting the mass multiplied by movement into action, should be extended to putting the army into the desired material and moral condition before engaging in battle.

If at the start of a war, victory is impossible in consequence of inequality of forces or unequal preparation, there is but one solution possible to attain the equality that will make victory possible. This solution is to take advantage of the time factor that space or natural obstacles may make available for postponing the battle until the proper moment. To delay engaging in battle would not mean to refuse to face battle. Delay is justified by the desire to prepare properly for subsequent battle.

Will that rule still be true in the future? Probably it will be for some time to come. It may be expected to be true as long as speed does not diminish too greatly the concepts of space and time.

The Air Battle Comes First

In modern warfare, the first action will be aerial warfare, provided the two opposing forces are equal.

This is what Spaatz, Tedder and Harris did in Europe. It is what the Americans did in the Pacific in their air-naval battles. When those battles were won, the outcome of the war was decided. All that remains is for the ground forces, aided by the air force, to occupy the territory over which the sky has been won.

What has this air battle been and what will it be? The offensive air battle is difficult to launch. First of all, it is necessary to find the opponent in order to destroy him; therefore, his territory must be penetrated. At present the air defense is stronger than the attack.

There are not too many difficulties in the way of finding the opponent. Reconnaissance will precede the action of the bombers, which will then attack air fields, plane factories and the industrial potential of the enemy. The latter can not show himself, under penalty of death, at the time of this destructive action. But he will assemble ground antiaircraft defenses and defense aviation to stop the offensive of the enemy air force.

The attack on the ground will then provoke the air battle proper, the struggle in the sky between the attacking air force and the defensive air force. If we confine ourselves to the losses that the two opposing air forces suffered in World War II, one must conclude that defense is stronger than attack, except in cases of considerable technical superiority on one side.

In the battle for England, in spite of the numerical superiority of the *Luftwaffe* over the RAF, the latter achieved an incontestable victory. There are several reasons for this. In the first place, radar permitted the English Command to carry on the battle economically. Next, the Germans failed to defend their bombing planes sufficiently. Finally, the Germans had to fight over enemy country. The latter is a positive disadvantage, for the defender has the help of antiaircraft artillery, without any counterpart in the hands of his enemy. On the other hand, every plane or every pilot that goes down is definitely lost for the attacker, but may often be saved by the defender. The defender also can fight longer over his own territory than can his opponent. The loss of a

fighter plane is less serious in matériel and personnel than the loss of a bomber.

Everything being equal, the attacker has more difficulties to overcome in carrying on the fight, and his losses will generally be greater than those of his enemy.

An attacker can only counter these difficulties by a stronger air mass, considerable material reserves, technically superior planes, a better tactical policy, and a victory which annihilates the numerical strength of the defender.

The Germans did not meet these requirements sufficiently during the Battle for Britain. Thus the German defeat made it plain to the English that they themselves were not prepared to launch air battles on the Germans. Perhaps because of their defensive victory, obtained under conditions of considerable inferiority, they did not believe that it would be possible for them to achieve victory. They did not feel they were ready to engage in battle. Hence they decided to attack the industrial potential of Germany only by night.

The American Command did not want to take that indirect way and wanted to engage in a fight for the freedom of the sky. At the Casablanca conference, the American air leaders obtained authority to engage in a strategic air battle for which they had been preparing for three years.

But it had been necessary to prepare the tool, develop the proper technique, prepare the necessary bases.

With the air force thus prepared, the Americans engaged in a massive battle. There was no attempt to use limited means, a practice so dear to certain Frenchmen and which is generally cause for defeat in war.

American mass was developed considerably. In 1944, at the strongest stage of their power, the Americans possessed 80,000 planes of all types, of which more than half were combat planes. The conception of mass has always been present in the spirit of the American command, whether it be a question of constitution or employment. The air force, General Spaatz reported, exploited the principle of mass to a degree never known before.

Armed with such an air force and convinced of the wisdom of its tactics, the American Command ardently launched itself into the fight. In the beginning, the Americans suffered considerably heavier losses in day attacks than the Germans. But the power of American industry permitted them to continue the fight, while German industry was handicapped by the destruction caused by the bombings.

Furthermore, losses did not stop the American attack. Even when losses increased abnormally, the Americans modified their matériel and the technique of its employment. It was thus able to protect its flights by strong squadrons of long-range fighters.

The battle receded from Pas-de-Calais to the interior of Germany, and the battle was won. The *Luftwaffe* disappeared from the sky. The Allied Air Forces were the complete masters after February 1944.

Then the mass attack on the German industrial potential was possible, and was begun without delay. The launching of the ground forces, which the Allied Air Force could from now on support, could also begin. The allied landings had every chance of success. That is what happened. It was made possible by an air battle carefully prepared and ardently executed.

Will it always be thus? The answer, definitely, is yes. The principle of battle is an everlasting principle. Air leaders must always engage in and win the air battle before being able to attack the enemy territory or before being able to offer air support.

The Projected Assault on Japan

Digested by the MILITARY REVIEW from an article by Martin Halliwell in the "Journal of the Royal United Service Institution" (Great Britain) August 1947.

IF there had been no atom bomb, or if the Japanese warlords had not used the two incidents at Hiroshima and Nagasaki as a convenient excuse to throw in their hand, how would the War have been carried on? What was the next step? Should we still be at war with Japan now? Would the Allies have landed on the Japanese mainland direct, or on the China coast first to make a diversion? When was the landing to be?

These are all questions of interest to military strategists, and of particular interest to those who fought in other theaters against the Japs, often with a feeling of frustration that their own efforts in Burma and Indonesia did not seem to be getting anyone much nearer the final assault on the Japanese mainland which would obviously be necessary one day. Some British officers knew the codewords OLYMPIC and CORONET for the landings planned by General MacArthur, but details were few. Not many realized, either then or since, that these two operations would have been in manpower and resources the largest-scale operations of the War and, because of the vast distances to be covered between mounting bases and objective, extremely hazardous in execution.

General MacArthur's strategic plan for the reduction of Japan, codeword DOWNFALL, had been completed in Manila in May 1945, and included the two operations OLYMPIC and CORONET (see map).

It is not difficult to get a picture of the strategy intended. The consideration which makes inevitable the choice of the Tokyo Plain (or Kanto Plain as the Japanese call it) is that this is the only area in the whole mainland of Japan where overwhelming mechanized land forces can be deployed to advantage. The rest of Japan, apart from the agricultural island of Hokkaido in the north, is a mass of intersecting mountain ranges and narrow, easily defensible valleys. Tokyo and Yokohama were the ultimate objectives and it would have been folly to put a large mechanized force ashore anywhere else and expect it to exploit across the intervening mountain masses in the short time at its disposal. This limiting factor was apparent to the Japanese too.

Before we examine what might have happened to these operations it is worth while to take a ruler and calculate the distances between the Tokyo Plain and the only mounting bases available: for example, 1,000 miles to Okinawa (the nearest base), 1,600 miles to the Marianas; 1,800 to Leyte and Luzon in the Philippines; 1,800 to Ulithi Atoll; 2,400 to the Admiralty Islands; and 3,400 to Hawaii. Most of these bases are of limited capacity, and the timing of assaults to converge on their target from so many different and distant Pacific starting-points was bound to be the source of many headaches.

The preliminary OLYMPIC assault on southern Kyushu was to have been on three different beaches, one corps at each with a fourth as floating reserve—more than a dozen divisions in all with a vast quantity of stores and air field construction material to bring ashore with them. Against them, according to the August 1945 dispositions produced by the Japanese and checked by American intelligence, the Japanese opposed nine divisions, two brigades and two tank brigades —a formidable force when you realize that hills and mountains cover all the chosen landing areas, and that the Japanese had already shown themselves on Okinawa excellent mountain fighters, able to retire

into deep caves and "sit out" the heavy air and naval bombardments with which Americans habitually preceded their assaults. On Kyushu too, they would have been defending their own homeland. Had the Japanese divisions been up to strength and their ammunition adequate, they might well have beaten back two out of the three American landings, and so greatly reduced the huge air force of forty groups which the Americans hoped to build up on Kyushu to support the main CORONET operation.

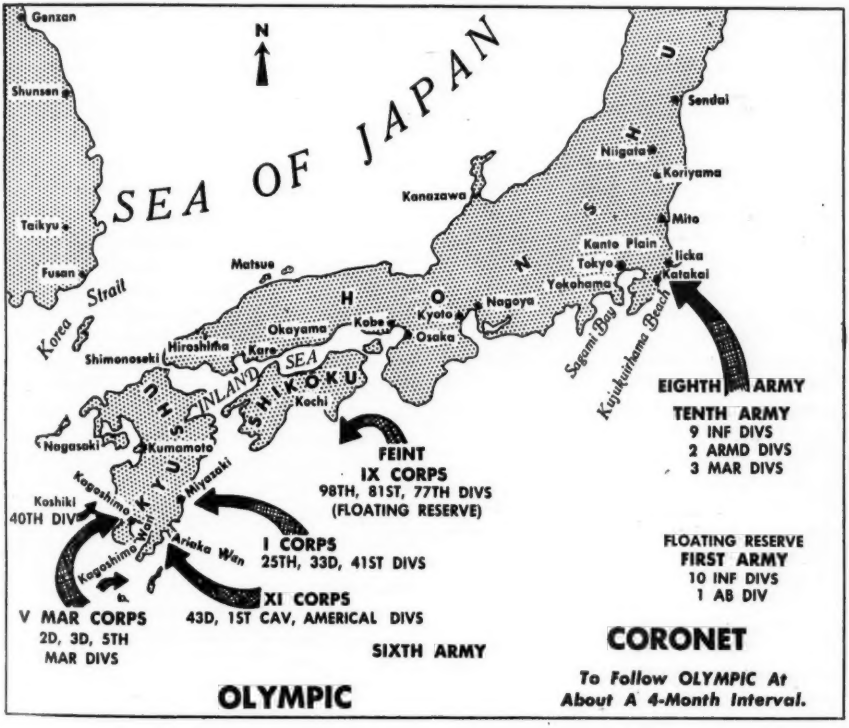
A secondary misfortune which would certainly have set back the preparations for OLYMPIC considerably, was the typhoon which swept southern Japan and Okinawa during September 1945, destroying large quantities of landing-craft, planes and equipment of all kinds on Okinawa—a disaster no one could have foreseen but which would have had to be reckoned with. Among the planes so destroyed would most probably have been the three RAF Lancaster squadrons which were to be based on Okinawa as the British contribution to the air support of OLYMPIC and the strategic bombing of Japan.

We must assume however, that all went well, and that in the four months available the Americans had established themselves and their aircraft on Kyushu. There was no question, incidentally, of using existing Japanese air fields, the concrete runways of which were much too lightly built to take our heavy four-engined aircraft without complete reconstruction. In the spring of 1946, then, the main Tokyo Plain assault would have gone in at Sagami Bay and Kujukurihama Beach. A date was chosen which would have been the last to give a reasonable chance of reaching Tokyo itself from the landing beaches before the melting snows flooded the intervening rivers and turned them into impassable, swirling torrents. Once more the same calculation had been made by the Japanese for themselves; in the hills behind the chosen beach on Sagami Bay, American Intelligence officers were shown by the Japanese preliminary clearings for launching a new type of catapulted suicide glider-bomb, to be guided by a human pilot so as to explode both himself and the bomb against supplies accumulating on the American beachhead about ten miles away. The ramps in these clearings, though unfinished in August 1945, were correctly aligned towards the chosen landing area.

The morning of what was intended to be D-day of CORONET I spent with American officers in the village of Katakai, which was the point on the long Kujukurihama Beach chosen for the first landings east of Tokyo. It was a most unpleasant day, with a forty-mile an hour north wind blowing icily down the flat beach, occasional sleet and long rolling breakers with plenty of surf. I do not doubt that the Americans would have achieved tactical surprise—one of the lessons of the war has surely been that such surprise for a landing is more common than one might expect—but sixty miles away in Tokyo it snowed continuously for several days thereafter, and the first few days of getting ashore and deploying mechanized vehicles across the sodden paddy fields would have been a most uncomfortable business under these sub-Arctic conditions. I suggested to one of the officers that he should collect a few shells off this fateful beach and send them to General MacArthur, who replied with a scribbled note: "Thank heaven these are our only souvenirs."

At the north end of the Kujukurihama Beach, at a tiny fishing village called Iioka, the Americans proposed to site the biggest artificial harbor yet used during the war—a 50,000,000 dollar affair to be built at San Francisco and towed out in sections to the spot. The site, however, is commanded by a long ridge of 250-foot hills, and it was only after examination on the spot that we discovered how thoroughly

the Japanese, who are expert tunnelers, had honeycombed the hills all round the Tokyo Plain with caves, underground storerooms, concealed gun emplacements and so on. The Iioka "Mulberry" would certainly not have been erected or used without enemy interference. In all, the two CORONET landings, the subsidiary operations by Marines inside Tokyo Bay, and the follow-ups, involved over a million men, nearly 200,000 vehicles and nearly 700 landing craft. Against about fifteen divisions in the initial assaults, the Japanese had about the same number stationed all through the Tokyo Plain—this in August 1945, with of course time to reinforce further as American intentions became clearer through the winter. It is certainly not possible to say that the Americans would have had anything like a walk-over, though we have to remember that they had up their sleeves the atom bomb, which most United States officers I spoke to agreed was to be used tactically to obliterate all opposition the moment it appeared likely that the target of Tokyo by 15 April might not be kept.



Fortunately, we shall never know how this gigantic scheme of operations would have turned out. It was, militarily speaking, at the most awkward stage of General MacArthur's preparations for OLYMPIC—

while almost all his landing craft were back in the United States for refit—that the Emperor of Japan in his historic broadcast on 15 August threw in his hand. The first Allied troops to reach Japan were, in fact, 200 men of the United States 11th Airborne Division who were parachuted in on 27 August near Tokyo, and were followed by the rest of their division air-landed the next day.

Resistance Movements in World War II

Digested by the MILITARY REVIEW from an article by Major General Sir Colin Gubbins, in the "Journal of the Royal United Service Institution" (Great Britain) May 1948.

THE British Commonwealth in June 1940 was on the defensive and it was clear that it would be years before invasion would be possible; what could be done in the meantime was to attack the enemy by unorthodox methods: attack his war potential wherever it was exposed and when invasion of the Continent did take place, to give maximum assistance to the forces of liberation. To undertake this task, an organization, Special Operations Executive, was created which combined the elements of various Government Departments that had been studying on these lines.

The plan, then, was to encourage and enable the peoples of the occupied countries to harass the German war effort at every possible point by sabotage, subversion, go-slow practices, *coup de main* raids, etc., and at the same time to build up secret forces therein, organized, armed, and trained to take their part only when the final assault began.

This plan involved the ultimate delivery to occupied territory of large numbers of personnel and quantities of arms and explosives. But the first problem was to make contact with these countries, to get information of the possibilities, to find out the prospects of getting local help. An even more immediate task was to find someone suitable and willing to undertake the first hazardous trip, then to train him and fit him for the job and insure communication with him when he had landed.

So the first organizational steps were taken—the search for suitable personnel, the setting up of training schools, the establishment of research stations for the production of specialized equipment and weapons, of wireless sets capable of being carried by one man, the production of identity papers, ration cards, demobilization papers, etc.; the provision of foreign currency, research into the methods of the Gestapo, experiments in the dropping of specialized stores from aircraft, and so on.

The personnel employed for active operations, whether men or women, came almost entirely from the armed forces of the Allies with, of course, a high proportion of British officers and other ranks and men from the Dominions. They were paid at ordinary service rates plus parachute pay; many of the British had been rejected for the services on account of age or minor informities.

The training course lasted from three to four months, including parachute training, with an additional two to three months for signallers, concluding with a specialized course on German methods, security precautions generally, "cover" and similar technicalities. This was the program for a man already trained as a soldier.

Control and Procedure

The Special Operations Executive was the responsibility of a specially nominated Cabinet Minister, but for all its activities of a specially military nature or which might bring military repercussions, it was operationally under the Chiefs of Staff. This operational control was decentralized concurrently with the appointment of Supreme Commanders so that Special Operations Executive's activities could be closely and properly coordinated in any theater with those of the three services by the theater commanders concerned.

On Chief of Staff, Supreme Allied Commander's appointment in 1943 to cover the Western European theater, Special Operations Executive's operations therein came under that Headquarters, later Supreme Headquarters Allied Expeditionary Force, and so remained until the end of the war except that Norway eventually was dealt with by Scottish Command and Special Operations Executive conformed organizationally.

Below the headquarters of Supreme Commanders and when offensive land operations began, coordination was achieved by the employment of Special Force Detachments (SF detachments) at Army Group and Army Headquarters. By this means it was possible to correlate the action of resistance groups behind the enemy's immediate front with the tactical operations of the armies, and carry out the Army Commander's requirements.

Sabotage

The general plan, altered in detail from time to time by the Chiefs of Staff according to the change of circumstances, directed the greatest possible hindering of the German war effort consonant with the building up of secret armies to take the field in open rebellion when required.

Sabotage is a generally useful term which has a hundred special facets. The first picture that springs to mind is of a railway line blown sky-high, of a motorcar exploding mysteriously in the street, of a telegraph line somehow out of order; but there is much more in it than that. Germany had occupied Western Europe with all its wealth of manpower, industry and raw materials which she rapidly harnessed to her war effort. Her war effort was, therefore, open to attack at every point of her war economy.

Attacks were duly delivered. Targets were not picked at random, but after full examination and discussion with the Government Departments concerned, chiefly the Service Departments, the Ministry of Economic Warfare, Chief of Combined Operations, etc.

Sabotage as well as being violent can also be "go slow," can be faulty work so that parts do not fit, or parts not delivered; but this is traceable and may be fastened on particular workers, and so is unpopular, especially among piece rate workers. Sabotage can be the misdirection of railway goods wagons by the simple expedient of changing the destination labels in the marshalling yards—this can produce much chaos. Sabotage can take the form of encouraging "malingering" in the German armed forces, which met with some success; or the encouragement of desertion provided the means are given to effect it.

Secret Armies

The object of forming secret armies was to produce at the moment required open armed opposition to the enemy behind his lines, aimed at his most vulnerable points, i.e., his lines of communication, particularly roads and railways; his communicational systems; his depots and repair organizations—in fact against all the services whose efficient functioning is essential if the troops in the line are to fight with the best ability. A further object frequently stressed in all directives was to provide an armed and disciplined force to maintain order when the Allied invading

troops had passed on, an extremely important function.

The timing of the action of these secret armies was eventually decided on as follows by Supreme Commanders concerned:

Normandy—to come into operation just before zero hour on D-day except for such forces reserved to assist the later invasion of France from the south under Field Marshal Lord Wilson.

Belgium, Holland and *Denmark*—as the Allied Forces approached the frontiers.

Norway—to coincide with the arrival of British troops.

Italy—on the opening of what proved to be the final offensive.

Malaya—to coincide with the landing of the invasion forces.

As the war developed, and as Allied strategy focussed on the invasion of France and the Low Countries across the Channel, so was the importance enhanced of anything that could be done in France to divert German forces from the Normandy beachheads and to interfere with their systems of supply and communications, particularly during the critical days of the initial landings and the build-up. France, therefore, was top priority for the six months preceding D-day.

France

There were many physical and concrete advantages which France possessed. First there was the wide extent of the country, which is relatively not highly populated, so that the finding of suitable dropping grounds was not very difficult and even pick-up operations by aircraft at night were fairly simple once the technique had been evolved. Second, the run for aircraft was comparatively short, so that maximum container loads were almost always possible. Third, France could be approached both from north and south, i.e., from bases in England and Algiers.

The history of the building up of the secret armies in France was studded with sudden arrests of key men, with discovery of our wireless sets and setbacks of all kinds. But the work was gradually accomplished in spite of a tendency towards centralization and the building up of a military hierachy, the dangers of which in warfare of this kind are obvious: if the head of a zone is caught with his executive records, tremendous damage will ensue; this happened more than once. Numbers to be built up were decided more by the availability of aircraft to deliver equipment and arms than the numbers willing to serve; the governing factor was not the available supplies but the rate of and volume in which they could be delivered.

From February 1944 until the end of the first phase of the Allied invasion, special efforts were made for France, using not only aircraft allotted for SOE work but additional aircraft from Bomber and Transport Command. From February to May alone, arms for 60,000 men were safely delivered throughout the length and breadth of France.

As 6 June approached, so the pressure for deliveries grew, and so also grew the need for precision both as regards time and place in what was being done. The invasion was planned for Normandy and all resistance plans had to be aimed at giving the maximum assistance to the initial landing and then to the build-up. Therefore plans had to be sent in advance to France in the shape of micro-films. Whether they concerned railway sabotage, destruction of telephone and radio communications, or whatever they might be, it was imperative that their possible capture by the Germans should not in any way prejudice the security of operations—in fact, that the most minute examination of those plans should not give any indication as to where the action was to be mounted. All operational directives were worked out with SHAEF to cover these points and to maintain secure the aspect of "locality of the invasion."

But what of time? To cover this point, a relatively simple "stand by" code was evolved which if picked up by the Germans would tell them nothing, but conveyed to the "resistance forces" that they should be on the look out for the "action" messages. By 1 June all sorts of things had happened giving clear indications to the Germans that invasion was imminent. The "action" messages were sent on 5 June, calling French resistance to commence action that same evening.

For SOE, this was the most critical point of the war. The weapons, the organization, the plan were all there ready—our one thought was how it would go on the day. The answer is a matter of history. "Plan Vert"—the green plan—for railway demolition started at once. Within the first week of the invasion, 960 railway demolitions out of a planned 1,055 had been well and truly carried out; similarly with communication and road demolitions; and the fighting behind the lines began. By August, 668 locomotives had been destroyed and 2,900 attacks on railways carried out in France alone. Our embarrassment was then to prevent a premature *levée en masse*, a rising of the French people. In this we were not wholly successful, particularly in the case of certain groups in the south of France who fought too early and suffered heavy casualties before the launching of the operation under Field Marshal Lord Wilson from North Africa. This swept like a wind through southern France and up the valley of the Rhone to the German frontier and hemmed in once and for all the German forces struggling to escape from Bordeaux and Toulouse and the southwest of France, before the net should finally trap them all, as it eventually did. The French Forces of the Interior came out into the open; thousands flocked to join and there was no way of stopping them.

The organized risings, worked out on SHAEF instructions, were so immediately effective that on 25 June the first daylight drop of arms in direct support of overt resistance was carried out—seventy-six Liberators, a diversion from the main battle front which was judged by General Eisenhower to be warranted. This was followed on 14 July by a daylight sortie of 400 Liberators, and feeling in France rose to fever height. After that there was no stopping them.

The final military conclusions on the subject were that organized resistance helped the main operations of the Allied Expeditionary Force as follows:

1. By sapping the enemy's confidence in his own security and flexibility of internal movement.

2. By diverting enemy troops to internal security duties and keeping troops thus employed dispersed.

3. By causing delay to the movement of enemy troops:

a. Concentrating against the Normandy beachhead;

b. Regrouping after the Allied breakout from the beachhead.

4. By disrupting enemy tele-communications in France and Belgium.

5. By enabling Allied formations to advance with greater speed through being able to dispense with many normal military precautions, e.g., flank protection and mopping up.

6. By furnishing military intelligence.

7. By providing organized groups of men in liberated areas able to undertake static guard duties at short notice and without further training.

Scandinavia

The results as they affected the movement of German reserves from Scandinavia to the battle front were striking. From Norway, there was a reduction in the rate of movement from four divisions to less than one division a month. From Denmark

the moves of two divisions, urgently wanted on the Western Front, were very seriously delayed. During the week 4-11 February, over a hundred successful attacks were made against the transport provided for these divisions. By the end of the week more than half the forty-four trains involved were held up in Denmark and six had been derailed.

Belgium

In Belgium, as the Allied armies approached, the secret forces were called from sabotage to open guerrilla warfare. During June they had already carried out 153 successful operations, mainly against rail and road communications, and in July this activity was increased to over 800 definite rail-cuts, forty-two train derailments and the destruction of sixty-five road and railway bridges. Now they came out openly to harass the German retreat, then to guide the Allied armies, to provide flank guards, to free Antwerp and to help in every way their own liberation and the destruction of the German armies.

Italy

In Italy, from the moment of the armistice in 1943, every effort had been made to create and stimulate the partisan movement in northern Italy. British and American officers and other ranks, and Italians too, were trained and briefed and dropped by parachute to organize and lead the thousands of Italians who were seeking to help in the liberation of their own country. When Field Marshal Alexander's final offensive was launched, there were 65,500 Italian partisans organized, armed and equipped to take part, and they were allotted their tasks by the Supreme Commander. They seized Milan, Turin, Genoa and other towns as the Allies advanced, and opened the way for the lightning advance to the Swiss frontier and the total surrender of Kesselring's forces. They saved from demolition by the retreating Germans the power stations and factories of the Lombardy plain, prepared for that purpose by special German squads; they fought gallantly and well in the common cause.

Far East

The operations in the Far East deserve a chapter to themselves. Things began on the fall of Singapore when a small group of officers and men went inland instead of evacuating and fought the Japanese on their lines of communication while their stores lasted and then took to the high mountains to organize resistance. In Burma, it started when one or two individuals "stayed behind" when the Japanese in their first triumphant advance overran the whole country. From these small beginnings great things eventually came. By incredible efforts of personal sacrifice and human endurance, an army of several thousand Karens, whose people were the victims of unspeakable Japanese cruelty, was gradually built up by British officers and other ranks parachuted in to organize, equip and train them. When, in 1945, the Fourteenth Army was racing to the capture of Rangoon, it was the Karen resistance, now grown to 16,000 strong, with a hundred and more British officers and other ranks, which held up the Japanese 17th Division for two critical days. And in that fighting behind their lines and in attempting escape across the Sittang River, 16,000 Japanese were killed and counted by resistance alone.

Conclusion

The late war was the first in which organized resistance in occupied territories was created, directed and supplied from outside in any appreciable degree. The reasons are clear, i.e., the inventions of the airplane and wireless telegraphy, their particular application to this method of war, and the vast areas of occupied territory.

Resistance was a factor which stretched the German Army and its security services far beyond what their High Command had

ever contemplated. They could not prevent sabotage for all their efforts. They could not prevent the organization of secret armies though they knew well it was going on.

What resistance actually entailed through the long years in the occupied territories was a day-to-day battle with the Gestapo, the Quislings and the Japanese secret police, one long continuous struggle, with torture and unbelievable suffering and death waiting round every corner at every moment. Yet there were countless thousands who undertook the task, to whom all that mattered was their own eternal spiritual indestructibility. They dedicated themselves to a cause they knew to be higher than self.

Military Art as an Academic Subject

Digested by the MILITARY REVIEW from an article by Cyril Falls in "The Illustrated London News" (Great Britain) 24 April 1948.

IN the third year after the conclusion of the greatest of wars the Army is being reduced in strength to an extent greater than the most pessimistic in its ranks had expected. The infantry, without which, according to Field Marshal Lord Montgomery, it is still impossible to win battles, has recently been subjected to another drastic cut in the elimination of the second battalions of regiments. There is a tendency to do away with front-line fighting troops for the sake of a large number of administrative or ancillary soldiers who do not themselves fight. So far as one can see, the fate of the real fighting units of the Regular Army in the near future is to be a cadre for expansion on the one hand and, on the other, a mother to the Territorial Army, which cannot yet be said to have been born.

In these circumstances the quality of the training which the Regular Army receives becomes of even greater importance than it has been in the past. The fighting force which it can produce immediately on demand must be small, so that it is urgently necessary that this should be efficient, and, indeed, there is no excuse for its not being so. Yet its other function, that of permeating, staffing, and in general animating a force on the scale which would be required in time of emergency, is even more vital. Both call for the best methods of training.

The layman's conception of training, as a mixture of drill and unit exercises in open spaces, is inaccurate. Useful as such types of training are, they represent only a small proportion of that which is imparted in the units and, above all, in the schools, under which term I include the Staff College, the Royal Military Academy, and every type of educational establishment. These two in particular have to include a great number of subjects, and there is no time for any which are not of practical value. The question to be answered is whether military theory and military history can be ranked under that heading.

As regards theory, there can be no doubt about the answer. The simplest tactical training contains a large element of theory, founded upon experience. It would be impracticable to work out each small problem purely in the light of common sense, necessary though that element must also be. When a company commander

learns that by night he must make different dispositions from those which he assumes by day, an element of theory is being introduced into his instruction. The same thing occurs when he studies the principles of village fighting, whether with a diagram or a model or in the open. Theory is, in fact, a short cut. It must accord with common sense and be accepted by the student as doing so, but it saves time and prevents errors and divergencies of method. If it should be adhered to in a wooden and unimaginative manner, it will undoubtedly cramp initiative and originality, and that is a danger always present. It can be overcome if the instructors are alert. I believe that they are nowadays, as in the years immediately after a great war they should be. And if there has been laid down a list of "principles of war," what can they be called but theory?

In the case of military history, the answer is more difficult, since it does not provide ready-made answers to any problem. The mere bookworm, who has steeped himself in the campaigns of the great captains and failed to learn how to command a sub-unit or carry out the functions of a junior staff officer, is unlikely to be efficient in war. Yet Napoleon was a great reader without being a bookworm. It was he who advocated reading and meditating upon the wars of the greatest captains, and he practiced what he preached. He profited from this form of study more than most commanders. In his first command he was called upon to operate in the Alpine theater of the War of the Austrian Succession, which he had particularly studied, and though the situation in which he found himself was not an exact reproduction of that of the Prince de Conti and Marshal de Maillebois in that campaign, it was close enough to it for his reading to become of direct practical value to him. Admittedly this is rare, because military history does not repeat itself. It does however, repeat situations which bear a general likeness to each other and which are governed by the same principles, precepts or warnings. It can never be more than one factor in military education—and that as regards strategy rather than tactics, because strategy changes to a lesser extent than tactics—but in my view it still has a part to play. This is at present the official view.

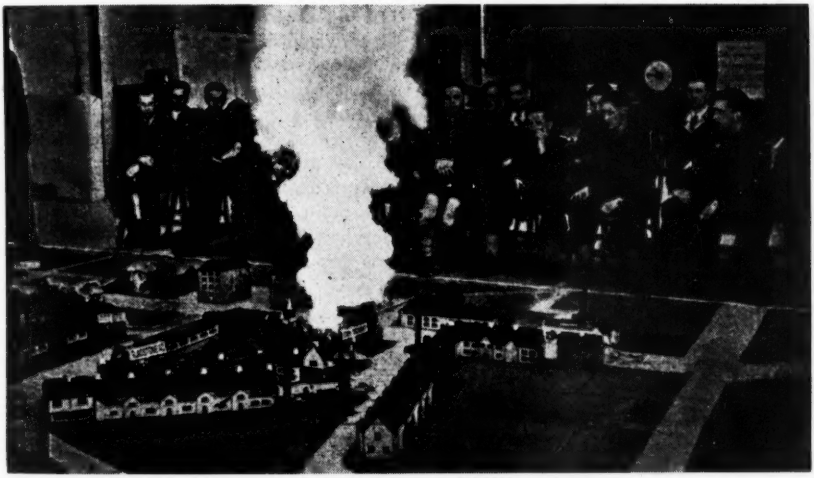
What can be said of history in general can be applied to the particular branch of the history of war. It enables the student to see and comprehend war as an entity. It shows him not only how and why wars break out, but also their nature and tendencies in relation to the type of civilization and social order, the geographical and economic situation, of the nations concerned, and the type of armament and industrial standard of the age. That it is often extremely difficult to read the lessons aright and that those who succeed in doing so are often disregarded, is no more than an illustration of human fallibility and the complexity of the subject. It does not imply that military history is of no use.

There is fascination and inspiration in discovering how our fore-runners lived and toiled and died. It cannot fail to stir the imagination of every intelligent soldier to learn how his ancestor existed and behaved, how he was armed and how he handled his weapons, what he thought of the war and of his commander, in what estimation he was held by his foe, how he was fed, what compensations he found in the hard and bleak life of warfare. It comes to us with a shock of amused delight when, in a foreign verdict on the English soldier of the Sixteenth Century, it is stated that he was a good fighting man but grumbled mightily if he did not get what seemed to the Continental soldier a vast quantity of food, also that one of his weaknesses in siege warfare was a habit of leaving the trenches to find rab-

bits. Information of this sort is not going to afford direct assistance in the winning of a battle, but it has its value in the broadening of the mind and in the stimulation of the imagination. The officer needs this as much as the man in any of the higher professions.

The first need of the soldier is to be able to fight, or to administer, or both, as occasion offers. The second is to find himself at home in the atmosphere of warfare, to have an understanding of war as a whole, to possess the power of estimating in what circumstances war will occur, what the upshot will be, and the significance of the successive phases of a war or a campaign. This latter must rank below the former in importance, but it is not to be despised.

There is nowadays a good deal of pressure from various points to narrow the military officer's education at all stages down to the severely practical. But severely practical men, who are nothing more, often reveal serious limitations. It is thus a matter of satisfaction to me that there appears to be an intention to resist this pressure and to make of our officers, so far as is practicable, what Bacon calls "full men," as well as men of action. The Royal Engineers have definitely that end in view as regards the students they send up to Cambridge. The science degree which these serving officers are expected to take is intended to be of practical value to them in their profession, but besides that they are expected to benefit from the life and associations of a great residential university. On narrower lines all can be given similar opportunities and the Army itself may exercise some of the functions of a university.



Studying the principles of village fighting at the British School of Infantry.

The German Services Merger

Digested by the MILITARY REVIEW from an article by Lieutenant Colonel G. M. C. Sprung, in the "Canadian Army Journal" April-May 1948.

ON 21 May 1935, the German government struck a clean blow at the heart of the modern high command problem. On that date the Armed Forces Law was enacted which prescribed that the German Armed Forces were to consist of Army, Navy and Air Force, and that there was to be a Commander in Chief exercising command authority over the three branches.

By itself such a law solved very little. In the tension-ridden scene of Hitler's Germany there was the exuberant and uncontrollable Goering with his new Air Force to bedevil the plot. While it was generally agreed that the German Air Force should be separate from the Army, Goering was not content with mere separation. He tended to act as if he were subordinate to no one but Hitler. His peculiar position as a party leader, as a Minister in his own right (aviation), and later as Plenipotentiary for the Four Year Plan, succeeded in embarrassing the Commander in Chief (von Blomberg) and infuriating the economic planning and procurement officers of the Army and Navy.

Of more serious proportions was the resistance of the Army to the very notion of a level of command above itself. The step-by-step reluctance of Army Headquarters to concede the transfer of functions to the staff of the Commander in Chief paralleled a running fight between the Army Commander (von Fritsch) and Blomberg concerning the very principles of strategic responsibility. It may be said that during the formative years (1933-1938) the Army sabotaged the growth of a joint services command from below.

Unknown to most, the services merger awaited a sabotage act, swifter and more deadly, from above. On 4 February 1938, Hitler dismissed von Blomberg and announced that henceforth he would exercise personal command over the three armed services. Thus was the military deprived of unified leadership within, and effective representation without. At the same time it was announced that out of the Defense Office of the Minister of War a Supreme Headquarters of the Armed Forces was created with General Keitel as its Chief. This set the character of the joint command for the duration of its existence. Lacking a military commander, it could perform few functions beyond briefing Hitler and effecting formal strategic coordination of Army, Navy and Air Force. Its main activity and merit as a joint services headquarters were to lie more in the field of administration.

As a coordinating staff from which, in the name of Hitler, strategic directives were issued, it did but occasional harm during the early years of German military success, 1939-1941. The Army, Air Force and Navy were, in practice, left alone to perform their tasks as they in consultation thought fit. After the failure to destroy the Russian forces in the autumn of 1941 Hitler relieved von Brauchitsch from command of the Army and succeeded to that post himself.

The long down-hill which led, in 1945, to the utter disintegration of the German high command began at this point. The Army General Staff became engrossed with the war in the East, leaving the other fronts—Africa, Norway, Italy and the West—to the supervision of the Supreme Command. This division of responsibility was as functionally nonsensical as it was practically disastrous. It resulted in the abdication by the Supreme Command of its proper functions. There remained no staff in Germany responsible for the strategic conduct of the war. There were in effect

two staffs, each charged with a portion of what was really one problem. The only coordinating instance was Hitler himself. In view of his preoccupation with the Eastern front it is little wonder that subordinate responsibilities became ill-defined, that personal rivalries flourished, that a once simple and effective war machine became complex, chaotic and confusion-ridden, and that it finally degenerated, shortly before VE-day, into the pitiful expedient of two supreme headquarters, one for the north, and one for the south.

The German Situation

Germany is a continental power, landlocked to east, west and south. Her maritime achievements have been in recent centuries, though not negligible, unmistakably secondary in the national effort. Her victories in war have been won by the army. Hitler's generals were acutely conscious of this tradition, and insisted on the primacy of the ground battle. Von Fritsch, Commander in Chief of the Army until 1938, and Beck and Halder, successive Chiefs of Staff, fought a running battle with Blomberg, Commander in Chief of the Armed Forces, on this point.

Air power had not yet arrived at the time when the Germans made their basic decisions concerning inter-service organization. Although Goering was allowed to develop an independent air force, this was done more to permit a swift and unhampered growth than to give it an independent role. Because an air force was thought to have its primary task in supporting the army, there never was an adequate representation of air officers on the German defense staff.

Germany was an authoritarian state during the period under consideration, and furthermore a militaristic state. In virtue of the first the Minister for War could be named without reference to any selective body, and in virtue of the second it was quite acceptable that he be a professional military man. In virtue of both, it was possible to unite the posts of minister and commander in chief in one person. By the appointment of Blomberg in 1935 this was done. The opportunity thus granted the military to develop a command and staff machine according to its own most cherished precepts was in modern times an unusual one.

That the Germans did not make more of the opportunity was due, among other things, to the lack of time for a proper study of the problem. It can not be emphasized too strongly how improvised the German joint staff organization was. The pressure of expansion in all three services was such that no embracing changes in organization could be afforded at any time between 1935 and 1939. Germany entered the war with a hastily improvised and in places quite illogical inter-service machine and during the war found time to create nothing but further illogical changes in it.

It should be noted that there is a certain artificiality in speaking of a German solution. From 1919 until 1945 the relationship of the services to one another was undergoing ceaseless change and innovation. There was never a firm organization which persisted unchanged for more than a few months. Prior to Blomberg's dismissal as Supreme Commander in 1938, though no Supreme Headquarters existed in name, it did so in essential fact. After Brauchitsch's dismissal as Army Commander in 1941 it rapidly ceased to function in fact, though it continued to exist in name. It is in conscious violation of many details that the period 1938 to 1941 is chosen as representative. During these years the Supreme Headquarters did at least formally coordinate the strategic aims of Army, Navy and Air Force and merits mention chiefly because it worked so little harm.

The role of a nation's armed forces in the national strategy will determine the general character of the military organi-

zation which is forged at the highest level. Germany's central position in Europe, relatively exposed to ground attack from east and west, has meant traditionally that the Army forms the main defensive and offensive instrument in the national strategy. This primacy of the Army continued under Hitler to be reflected in the preponderant influence exercised by senior army officers in the Supreme Command, and by the many residual functions—recruiting, railway transport, signals and others—performed by the Army for joint purposes.

The Germans further decided that even the highest decisions in war would be of an operational nature, and planned therefore to leave field command in the hands of the same officers and staffs which in peace were responsible for departmental policy. In practice this meant that at Zossen, one hour's drive from Berlin, accommodation was prepared for the Supreme Commander and a small staff which included operations, intelligence and quartermaster sections. Army Headquarters divided itself in the same way, moving a forward echelon to a command post in the field, while leaving a rear echelon in Berlin to perform administrative duties. The essential thing here is the highly centralized, yet simple defense organization which adhered to the principles of command through all echelons of inter-service organization. This solution is not in any sense inevitable under the given conditions, and is not even necessarily the best. Yet it is clear that once it is decided to invest the highest inter-service body with command responsibility, any notion that such a body could take the form of a committee becomes unthinkable.

The German solution to the problem of integrating control of the defense forces with other departments of government was very simple: the commander of the three armed services was at the same time minister of war and a member of the cabinet. It is true that this simple arrangement was disrupted by Blomberg's dismissal in 1938. The post of Minister lapsed with Hitler's personal assumption of command and Keitel's appointment as "Chief" of the Supreme Command. The principle was preserved, however, according to which the formulation of defense policy was in the same hands as its execution. It can not be said that Germany benefitted greatly from Hitler's application of this principle. It must remain an unanswered question how successfully even Blomberg would have combined the manifold duties of his double office. As early as 1937 the Army General Staff (for reasons of its own) was forcefully arguing the impossibility of Blomberg's position. Von Fritsch, then Commander in Chief of the Army, contended that in a war it would be necessary for the Minister to attend to his ministerial duties, while appointing a Generalissimo to command in the field. Failing that, if Blomberg insisted on commanding himself, then he must name a Secretary of War to remain in Berlin and act on his behalf as Minister. This cardinal difficulty, thanks to Hitler's interference, never received subsequent attention.

Having determined that the military head of the three services was not to be a Chief of Staff, responsible to the Minister for the activities of the joint headquarters, but was to be a joint commander, one very important organizational consequence followed. All staff functions which it was decided to place on an inter-service basis could be organized into joint staff sections, preserving a clear line of authority from the commander downward. Essential functions were not entrusted to committees, the fundamental weakness of which is that members are guided by a primary loyalty to their respective superiors, rather than to a joint superior. Thus, many fields—planning, intelligence, economic mobilization, manpower, to mention a few—became the re-

sponsibility of staff sections and not committees.

"Wehrmacht" Comes into Being

Had Blomberg been given the opportunity to command the three armed services in war he would have been greatly assisted by an imperceptible but basic change which was coming over German thinking on the problem of the services merger. Prejudice, rooted in the traditional separation and rivalry of the services, is the greatest obstacle to their joint action. It is interesting to think that the flexibility of the German language eased the solution of this most difficult and important of all modern military problems. By finding and getting accepted one word (*Wehrmacht*) for Army, Navy and Air Force, and what is more, an impressive and easy word, the crusty tradition, according to which there are three defense forces in the nation, was to a large extent overcome and forgotten. It must be understood that in the German conception, Army, Navy and Air Forces were not artificially put under one command; it was far more that the one Defense Force was divided for administrative, training, and certain command purposes into three component parts. Though this was as revolutionary to Germans as to anyone else, nevertheless, thanks to the combination of flexibility and rigidity peculiar to the German mind, it soon became unquestionable doctrine. In fact, so widely was it accepted that many still think the word *Wehrmacht* means Army.

Having brought into being a joint staff under a joint commander, the question of the staff's function becomes the decisive problem. This question formed the subject of a running battle between the Army generals and Blomberg's headquarters. The Army was deeply concerned that Blomberg's staff should not develop into a true joint staff capable of strategic planning and the control of strategic forces. The Army General Staff felt it had the inalienable right to formulate and direct the national strategy. Blomberg's attitude is best attested by the fact that in 1936 he established a Joint Services Staff College in Berlin, thus inaugurating a still growing trend. There can be little doubt that in his view the modern problems of war demanded a Defense General Staff. Hitler's assumption of direct command in succession to Blomberg settled the issue, albeit unintentionally, in favor of the Army. Because Keitel, a soldier, had no command authority, and because Hitler was not competent to command, Supreme Headquarters on the operational side was not built up initially beyond the requirements of a secretarial and briefing staff.

Supreme Headquarters did include a section which controlled secret intelligence on behalf of all three services, but strategic and operational intelligence were functions of Army, Navy and Air Force, each in its own field. The joint intelligence section appears to have performed the mechanical function of collating reports from the services without itself producing defense appreciations. The operations section is the most enlightening of all. Nowhere else does the blighting influence of the German Army on joint organization come more clearly into focus. The operations section was not joint at all. It was composed of three sub-sections, one each for Army, Navy and Air Force. The Army section was large and in the later stages of the war proved capable of directing operations in the west. The Naval and Air operations sections were small and in fact were mere liaison staffs between Supreme Headquarters and Naval and Air Headquarters. The commander of the Navy and the commander of the Air Force did not receive any but the most formal orders through Supreme Headquarters, receiving current direction from Hitler personally.

The staff method of producing a joint strategic directive appears to have been

the following: On Hitler informing his three service commanders that he proposed to deal with a certain situation by force of arms, and after he had outlined his political purposes and any political factors which affected operations, the commanders and their staffs produced plans in direct consultation with one another. On these plans being approved by Hitler, the staff at Supreme Headquarters prepared a directive giving the barest outline of the operation, and this was then issued over Hitler's signature and became the directive on which the operation was based. During the subsequent action coordination of the efforts of the three services was achieved in the same manner, namely by direct liaison on joint problems, with Hitler functioning as final arbiter if agreement could not be reached otherwise.

The advance or field echelon of Supreme Headquarters included in addition to the operations and intelligence sections, a Quartermaster Branch which never achieved embracing control of procurement and supply for the three services. It was responsible for procuring and allotting liquid fuel and lubricants, but beyond that merely paralleled the Army Quartermaster staff for minor theaters. A Chief of Armed Forces Transportation existed separately and was responsible for liaison with railway officials to insure that the needs of the armed services were provided for. A Chief of Armed Forces Signal Communications was responsible for the operation of all means of signal communications between military and civil organizations concerned with defense.

Host of Staff Sections

The rear echelon of Supreme Headquarters consisted of a host of administrative and miscellaneous staff sections, which included the following:

Interior Branch (domestic political problems)

Welfare and Pensions Branch

Vocational Training Branch

Scientific Branch

Casualties Branch

Prisoner of War Affairs

Military Economics and Armaments Office (a staff responsible originally for planning industrial mobilization, for allotting raw materials and for supervising contracts entered into by the three services)

Legal Branch

Budget Branch (estimates and allotment of funds for the three services)

Special Staff for Economic Warfare.

In the period following December 1941 the tendency to add administrative functions to those already performed by Supreme Headquarters grow stronger. Among those so added the following can be listed:

Armed Forces Motor Transport Office

Armed Forces Conscription and Recruiting Office

Armed Forces Medical Services

Armed Forces Political Indoctrination Staff

Armed Forces Provost Service

Armed Forces Mapping Service.

The final element of the problem with which it is planned to deal concerns the functions which the German solution assigned to the unilateral service headquarters.

This is perhaps best illustrated by the activities of the Army High Command. On the outbreak of war it was planned to move the bulk of the General Staff into a prepared field headquarters with a small forward echelon of the Personnel Office, and to command the battle from there. The remainder of the High Command, including the Procurement, Administrative and, in the main, the Personnel Office, were left behind in Berlin under the direction of the Chief of Army Equipment and Commander of the Replacement Army. This latter officer was under the command of the Army

Commander in Chief who was at field headquarters. The Army Commander in Chief was responsible for every aspect of his command in the normal way. He was responsible for induction, training, equipping, organizing and battle command of the Army.

The responsibilities of the Navy and Air Force Commanders in Chief were, in essence, identical with those of their Army colleague. It is clear from this fact alone that the Supreme Command under Hitler was not intended to engage in the details of ground, air or sea operations. Hitler apparently intended originally to leave command in the hands of his professional officers, contenting himself with insuring harmony between Defense Force policies and the other departments of government and with setting the most general strategic aims by which the services were to guide themselves.

In the practice of war this conception was adhered to fairly consistently and with but few lapses until after January 1942. It meant that during the early campaigns in Poland, France and Russia, there was in fact no joint staff directly responsible for operations at any place in the whole German Defense Force hierarchy.

Faults in System

If it can be said that the German system proved adequate during 1939-1941, that is largely negative praise. It incurred no blame largely because it did nothing. In effect the Army, Navy and Air Force carried on with their operations, cooperating where necessary, much as they would have done under a Joint Chiefs of Staff Committee. Had the Supreme Command attempted to direct operations the faults of the system would at once have become apparent. There would have been two command echelons attempting essentially the same tasks. Once again this is particularly clear in the case of the Army. During the 1940 campaign in the West, for example, only one headquarters was needed to command the land battle. This happened to be the Army Headquarters, although Supreme Headquarters had moved into the field also, with nothing to command except Army Headquarters itself. The duplication is obvious. If Hitler had wished to use his staff to conduct the battle, then the Army staff would have been superfluous. This absurdity had been foreseen by von Fritsch, then Commander in Chief of the Army, as far back as 1937.

If, on the other hand, Germany were expecting a multi-front war, then further fundamental faults should have been corrected. If units of any one service are in combat in widely separated theaters, they clearly cannot be commanded by the commander in chief of that service. Yet the only solution, namely the appointment of theater commanders, was never clearly provided for. Once again, if the strategic coordination of several fronts is to be the task of the joint staff of Supreme Headquarters, then the need for a command headquarters for each of the three services disappears. If these headquarters do not disappear there will be four staffs issuing orders instead of one.

Summary

The principles which guided the Germans in their solution of the services merger problem can be briefly restated as follows:

1. Because of Germany's strategic position the Army dominated the "merger."

2. Departmental staffs performed operational duties in war.

3. The Minister of War was at the same time commander in chief of the armed forces.

4. The commander in chief was permitted a defense staff theoretically adequate to effect strategic coordination of the three services, and in fact adequate to carry out a great range of joint administrative activities.

5. Strong Army, Navy and Air Force headquarters were retained through which Supreme Headquarters exercised command.

In reflecting upon this historically crucial experience of the German failure to "merge" the three traditional fighting services, it is not easy to say whether the enduring lessons of the experiment lie more in the notions which were sound or in those things which were left undone.

The German solution was a compromise. It deferred to the pride of the individual services by allowing them to retain strong headquarters staffs, while creating a supreme or joint headquarters with overriding powers yet so economically staffed that it could not encroach upon the duties of the services. This was sound, in that the Army, Navy and Air Force in most countries would now and for some time to come will probably continue to obstruct any move to strip them of unreduced authority over their own forces. It was unsound, in that no genuine residue of strategic intelligence and planning functions remained for Supreme Headquarters. Unbelievable as it sounds, there is no evidence that Hitler called for or received appreciations of Germany's strategic position either before or during the War.

In the administrative field the German merger achieved greater simplification and economy than has probably been attained in any country since. Yet the very success in this field may well have obscured the cardinal failure to bring together the operational staffs in useful cooperation. It is significant that Keitel, "Chief" of Supreme Headquarters, took up his duties in 1938 where Blomberg had dropped them, but by 1945 he had imperceptibly lost his hold on operational matters and had become the administrative head of what could be called the Department of the Armed Services. Apparently an administrative merger is not a full solution of the problem.

The three armed forces, particularly ground-air and naval-air combinations, will become increasingly inter-dependent as technical progress tends to render common hitherto differentiated purposes, objectives and methods.

General Gaetano Cardona, Italy

Soviet Employment of Armor

Translated and digested by the MILITARY REVIEW from an article by General Niessel (Reserve Corps) in "Informations Militaires" (France) 10 February 1948.

IT has been strongly emphasized that tanks generally must make use of surprise, be employed in mass, and be protected by other weapons. Particularly on entering action, tanks must be protected by artillery. In addition, protection by aviation is useful to tanks. Marshal (of tanks) Rotruistrov of the Soviet Army has insisted on such a role by aircraft.

When not in action, tanks should be carefully concealed or camouflaged. Colonel General Rondenko (Soviet Air Force) has pointed out that the tracks left by treads often betray the presence of tanks. That was the case at the beginning of the battle of Kursk in July 1943. Large German tank groups were carefully concealed in the forests, but their tracks had been discovered and Russian planes were waiting to attack. As the German tanks started to get under way they were violently bombed, many were set on fire, and the impetus of the attack was considerably retarded.

Numerous articles have called attention to the necessary precautions which must be taken by tanks before going into action. They are grouped first in an *assembly zone* from seventy to 100 kilometers from the front. Shortly before launching the operation they are moved to a *waiting position* about twenty or thirty kilometers from the front and kept in concealment. When the attack is about to be launched, the tanks move to their points of departure. These positions are as close as possible to the front; ten to twelve kilometers away at the furthest, and closer if the ground permits. Even if the tanks must proceed from the waiting positions by several routes of approach, they must be in position for the attack at the proper time. It is considered most important that tanks which are concentrated in formation be protected against enemy air attacks by fighter aircraft.

Employment of the armored weapon is influenced by cavalry tactics. Tank employment demands prompt decisions, great maneuverability, and rapid movements. Colonel General Galitzky has stressed the careful training of armored units, and numerous writers have emphasized that in the event of an unexpected encounter between tanks the side which opens fire first has the best chance for success. In a battle of opposing tanks, the Soviets recommend that the opponent be attacked from the flank; in this manner the attacker gains fire superiority. In a frontal encounter, it is maintained, the two lines of tanks pass through each other, and no decisive result is obtained.

Breakthrough

A particularly important phase of armored tactics is the execution of a breakthrough. In the light of present antitank defenses, the breakthrough of the first line was, in 1944 as in 1916, a matter of methodical destruction by artillery and aviation, with the tanks able to intervene only after the first obstacles had been cleared away. Most writers do not visualize the employment of tanks during that phase of the action. Preparation by artillery and aviation is indispensable, but the infantry nearly always has been aided in that phase by tanks in small numbers in order to reserve as many tanks as possible for the formation of large rapid groups. Marshal (of tanks) Rotruistrov has indicated that the employment of unassigned tank regiments for this mission, usually one to each infantry division, is desirable, and that an average density of thirty tanks per kilometer of front is suitable. Several authors also say that they should not be distributed equally

everywhere, but used mainly in support of the main effort. These tanks leave their points of departure so as to bypass the infantry line at the moment when the latter begins the attack, thus gaining the protection of direct fire weapons and the mortars firing against the enemy antitank guns. The infantry follows the tanks as closely as possible. If the infantry stops, the tanks do not fall back but make an effort to stop the fire which has held up the infantry advance. When the infantry penetrates the first trench, the tanks move on toward the next trench. Often tanks are supported by self-propelled guns, following at approximately 200 meters. Whenever an objective is passed, the tanks assemble in concealment and become available for other tasks. As a rule, it is only when the breakthrough is considered complete that large groups of armored vehicles exploit the breakthrough by encircling the enemy or launching a pursuit.

Bypassing Resistance

It is recommended that tanks not delay their advance by engaging centers of resistance; they should limit themselves to suppressing the fire of such points, bypassing them, and leaving the task of mopping up to a part of the motorized infantry which accompanies them or to the large combined-arms units which follow. In the battle of the Don Moyen, which began 16 December 1942 and led to the destruction of the Italian Army in Russia, the First Guard Army failed to pierce the Italian position on the first day. A part of the 25th Tank Corps was used the following day to help the infantry effect the breakthrough. The remainder of that tank corps, plus the 17th and 24th Tank Corps and several unassigned regiments, were assembled and ready for the exploitation which took them 200 kilometers. As a rule the armored groups did not go into the penetration until the breakthrough was assured. Another example is the conquest of East Prussia. Colonel General Volsky (armored forces) has stated that south of that province the tank group was not sent into the penetration (after having executed a night march) until the fourth day, at which time the penetration was already thirty kilometers in depth. The tank group then covered 230 kilometers in seven days, reaching the valley of the Vistula where the retreat of the German forces was cut off. In the offensive coming from the east, it was only after five days of heavy fighting, during which the Russian troops had wiped out forty-two lines of trenches some twenty kilometers in depth, that the armored group of General Gondkove used the breach for getting at the German troops from the rear.

In exploitation or pursuit operations, it is usually the intent to cut the enemy forces to pieces in order to facilitate their encirclement, and armor halts only if it runs out of gas. After the battle of White Russia during the summer of 1943, pursuit operations occupied the Russian armies from Beresina to the Vistula, and, some months later after the forced crossing of the Vistula, on to the Oder.

Defensive Use

Tanks are intended primarily for offensive action. However, they also played an important role in the defensive battles of 1941 and the summer of 1942. At that time, tanks were usually placed in concealed positions so that they could make surprise counterattacks; or they were used to augment defensive fire. At the start of the battle of Kursk, some defense sections were entrusted to large tank units reinforced with infantry and artillery. Tanks with the 6th Guard Army engaged in the general artillery counter-preparation, although the antitank regiments and the artillery batteries intended for antitank defense did not participate so as not to disclose their positions.

General Vakonbovitch has stated that in an unexpected encounter between tank

units, the speed of maneuver plays a decisive role. A method frequently employed in such cases has been to push forward the tank units that had been in reserve and to reassemble behind them the units which had been deployed.

Cavalry with Tanks

Also significant is the Soviet employment of large cavalry units in combination with large armored groups. That was done in the battle for Moscow in December 1941. In the encirclement of Stalingrad in November 1942, three army cavalry corps operated with the armored or mechanized corps:

1. The 8th Cavalry Guard Corps with three divisions, 22,500 men and 18,000 horses, with the 1st Tank Corps;

2. The 3d Cavalry Guard Corps with three divisions, 16,000 men and 15,000 horses, with the 4th Tank Corps;

3. The 4th Cavalry Guard Corps with two divisions, 10,300 men and 9,300 horses, with the 4th Mechanized Corps.

During the encirclement of German troops on the right bank of the Dnieper in 1944, the cavalry operated closely with tanks before the encirclement took place. Afterwards the cavalry established an outer front which stopped enemy efforts to pierce the encirclement.

Night Action

An important point on which Russian concepts differ from the French is that the French consider the use of tanks at night as impractical. The Russian military press gives numerous examples of night marches by the tanks, and night battles in which they were engaged. Colonel Komarov has written that night operations became common practice, and even large tank groups were engaged when it was possible to illuminate the ground by artificial light. The beginning of the battle for Berlin furnishes a remarkable example of night tank action. In the middle of the night after twenty minutes of intense artillery preparation, Soviet tanks advanced on a wide front over ground lighted by powerful searchlights. By daybreak, the infantry had progressed from two to three kilometers. This is not an unusual example. An English magazine cites two cases, during the final period of the war in Italy, of tank attacks executed at night with the aid of artificial lighting.

Strategy of the Second Battle of France

Translated and digested by the MILITARY REVIEW from an article by Colonel José Hijar in "Ejército" (Spain) April 1948.

THE invasion of the European continent by the Anglo-Saxons in 1944 may be considered as the most extensive amphibious operation in history.

The concept of the invasion had its beginning in the minds of the English strategists on 4 June 1940, when the Prime Minister informed the House of Commons about the Dunkirk disaster. He declared that, in spite of this defeat, the will to fight must be continued. This fighting spirit was evident the fall of the same year when the Commandos started functioning.

Nevertheless, the idea of defense dominated the plans of the British Imperial General Staff, since it was considered highly probable that the Germans would invade the British Isles.

Planning

On 22 June 1941, when Russia entered the war against Germany, the fear of a German invasion diminished greatly. Officially, however, the defensive concept

was maintained until the entry of the United States in the war and the establishment of the Combined Chiefs of Staff. At that time, offensive planning was initiated.

The projected plan of invasion, designated as *Overlord*, was drawn up by the middle of 1943, and upon its presentation to the Combined Chiefs of Staff and its approval by the Allied nations at the Quebec Conference, its detailed study was instituted immediately. At the Teheran Conference in November, the USSR insisted on the formation of a third front in the West, expressly in France, since the second front in Italy was only engaging nine German divisions. In view of this situation, instructions were issued to the British-Canadian forces and to the United States forces in connection with *Overlord*. General Dwight D. Eisenhower was informed of his designation as Supreme Allied Commander in December. He assumed command in February 1944, and, after increasing the number of divisions in the assault landing from three, as previously planned, to five, he designated D-day as 5 June 1944.

The work of drafting and preparing the invasion plans was carefully undertaken. For this phase, intelligence collected by the Commandos in a series of reconnaissance in force along the coast of Europe, and especially in the Dieppe raid of 19 August 1942, was available.

In the preparatory strategic phase, the strategic bombing of Germany was intensified, starting in May 1943, and increased in intensity until the end of the campaign, in order to have mastery over the German air force by May 1944. Its objective was to destroy the six essentials of the German war effort: submarine pens, aircraft, ball bearing, gasoline, and rubber factories, and lines of communication.

In connection with communications, the attacks against the railroad centers started two months before D-day, covering at first a very wide area so as to keep from the enemy any indications as to the beaches selected for the landings. Attacks were delivered against bridges throughout the northwest sector of France starting a month and a half before D-day, in order to isolate the battlefield from the rest of France. This was done by cutting the bridges across the Seine downstream from Paris, and those on the Loire downstream from Orleans.

Finally, twenty days before the assault, attacks were carried out against air fields, to neutralize them and compel the German fighters to operate from distant airdromes.

German Plan of Defense

Germany was overextended due to past offensives. The advantages Germany had gained in the fight against England on winning possession of the extensive European shore line, had turned against her when the Allied Armies were to be ready for the invasion of the continent because Allied naval superiority constituted a potential threat against the entire coast. This made it mandatory for the Germans to build extensive fortifications and to garrison thousands of kilometers of front, while the Allies could concentrate all their efforts in one sector.

The Germans believed that the assault of the continent would be launched across the Straits of Calais, and they assembled the Fifteenth German Army in this sector. The Allies, on the other hand, led them on in this belief by concentrating their troops along the east and southeast coast of England, rather than in the southwest.

The German dispositions were based on the experience gained at Dieppe, according to which all invasion attempts could and should be destroyed on the beaches. Therefore the defensive system lacked depth.

One more fundamental point of the German defense plan was that of accumulating forces at the seaports in order to defend

them strongly, and to destroy them in case of failure. In line with this reasoning, the ports of Cherbourg and Le Havre were reinforced for defense by building a series of concrete fortifications, well protected and prepared for all around defense, with mine fields in front and underwater obstacles on the beaches facing them. Strong points bypassed by the Allies were to resist at all costs in order to delay the advance.

Behind these defenses there was no other line. The profound faith the Germans had in their "Westwall" and the delaying power of modern equipment protected by fortifications led them to believe that a mobile reserve would not be necessary to prevent the Allies from achieving initial success.

Allied Plan

The Allies intended to destroy the German forces in France and Western Europe by completing three phases:

1. The seizing of a beachhead in Normandy.
2. The consolidation and development of the beachhead.
3. An advance through France and the Low Countries in Western Europe.

The assault plan was to be carried out in the landing area on the coast between the mouth of the Seine River and the

Cotentin Peninsula. The reasons for this selection were that it was less defended than the Straits of Calais, since the Germans were expecting a landing there. Also, it was located between the important ports of Le Havre and Cherbourg and, upon extending the beachhead, both ports could be occupied from the rear. In order to support this action, airborne troops were to drop on the flanks of the beachhead.

After consolidating, joining and reinforcing the beachheads, the line Vire-Falaise was to be captured.

From this line the British-Canadian forces were to advance to the Seine, while the Americans would reach the Loire to form a joint front along the line Le Havre-Paris-Fontainebleau-Orleans-Nantes three months after the landing.

After crossing the Seine, the Allies would reach the Somme and the Marne, and from there would head toward the German frontier.

Execution of the Plan

The assault was carried out on 6 June on a five division front against the beaches between Ouistreham and Varreville. The American forces assaulted the beaches of Varreville and St. Laurent while the British-Canadian forces did the same at Ouistreham, Courselles and Asnelles.

A British airborne division landed behind the beach defenses in order to occupy vital points on the Caen canal, while the American airborne troops dropped southeast and west of Sainte Mere-Eglise in order to capture the crossings of the Merderet River and to hold the defensive line of the Douve.

There was a double surprise for the Germans in this phase. There was strategic surprise, because they were expecting the landing on the Straits of Calais area and not where it actually took place. Due to this trend of thought, the Fifteenth German Army was kept inactive at Calais and it was not until 25 July that its first elements were displaced to reinforce the Normandy front. By that time the Allies not only had consolidated their gains but the German defense of Normandy was crumbling.

There was also tactical surprise, due to the air bombardment started on the night before and continued during D-day, which caused considerable destruction to the communications and radar nets of almost all the beaches. This resulted in a lack of information at the headquarters of the German commander, keeping him ignorant of the true magnitude, extension and objectives of the landing. The combination of all these factors determined the slowness of the German reaction.

In regard to the invading forces, not everything met with success at the start. The American forces of the VII Corps landing at St. Laurent found themselves in a tight spot because of ineffective air bombardment and the intervention of the German 352d Division. The 101st Airborne Division also was in grave danger due to the mistakes of the pilots in spreading the troops excessively. In these sectors the Americans suffered heavy casualties.

In spite of all these difficulties the Allies succeeded in establishing a firm beachhead and the Germans, realizing this, redoubled their efforts on the Caen front to block the British-Canadian advance from the Orne pass and the approach to the Seine, and on the western flank by holding the hills that dominate St. Lô, and by opposing the junction of the two American columns separated by the Vire. Nevertheless, on 12 June, upon capturing Carentan, all the separate beachheads had joined into a single beachhead covering 100 kilometers and having a depth of eight to twenty kilometers.

The Germans, in losing the battle of the beachhead, at the same time lost the initiative, which was serious. At this time the German objective changed to the hold-

ing of Cherbourg. They attempted to re-establish the wedge between Cotentin and Calvados in order to divide the American forces. On the right flank, they sought to hold Caen at all costs.

The Anglo-Saxons, on the other hand, in order to assemble forces and develop the power necessary for the attack, were in need of more space for deployment and maneuver. To fulfill this need, they started the second phase of combat.

This phase lasted for six weeks, during which time the Allies had logistical superiority. German supplies and reinforcements moved very slowly because of the destruction of lines of communications by the Allied air arm and by French sabotage. Meanwhile up to 15 June, the Allies had landed about 500,000 men.

The Germans attempted to form a strong mobile reserve for a large scale counter-attack to recapture the initiative, or to employ as an elastic reserve whenever needed. With this as a goal, they tried to concentrate their armor. But due to the lack of infantry divisions, the Germans had to use their armor to cover the breaches every time the Allies made a thrust. This took place every time the Germans tried to remove one of their Panzer Divisions from the line. In addition, because of the critical conditions at some of the points along the front, it was necessary to employ the forces piecemeal as they arrived on the battlefield, a method which destroyed their efficiency since they did not operate as units.

In the western sector, the Americans not only checked the attempted German wedge, but the VII Corps on 17 June cut across the Cotentin Peninsula west of Barneville, thereby permitting the initiation of the attack against Cherbourg, which capitulated on the 26th.

In the east, the Germans tried to push the English from their positions in the Caen sector by concentrating several Panzer divisions (700 tanks), but they only succeeded in weakening the divisions of the Seventh German Army and the Western Panzer Group, which was tied up on the Caen front.

In general, the first half of July saw hard fighting with both adversaries losing heavily. By 18 July, however, the Allies had reached the line Caen-St. Lô from which the penetration attack was to be launched. There now was enough room for the fifteen American divisions and the British-Canadian troops to maneuver.

On this date von Kluge relieved Marshal von Rundstedt, a very serious action at this critical moment.

The Breakthrough

The penetration from 25 July to the middle of September can be subdivided into two phases: the advance to the Seine-Loire line, and the advance to the German frontier.

The advance to the Seine-Loire started on the 25th and was supported by intense air bombardment. The British and Canadians tried to penetrate from Caen to Falaise and the Americans from St. Lô towards Coutances, in an attempt to trap the Germans in the Cotentin peninsula.

The Germans offered a great deal of resistance in both sectors and the Allies obtained no worthwhile results during the first few days. Finally on the 28th the Americans reached Coutances. Some German forces, although disorganized, managed to escape but others remained trapped.

The German commander had seen from the start the importance of these attacks and on the 25th started shifting some of the troops from the Straits of Calais area to the Normandy front, since the potential threat at Calais was less serious than the critical situation existing in Normandy. The idea was to establish a solid line of defense from Caen to Avranches. The Allies realized that the German defense was staggering and that speed was essential. In order to keep the Germans from building up their reserves they con-

tinued the advance. On the 29th and the 31st, Granville and Avranches were captured, thereby opening to invasion the Brittany Peninsula with all its important ports.

For this purpose, General Patton's Third Army, formed on 1 August, rolled south through Avranches, reaching the suburbs of Rennes the next day.

The Germans saw that there was a critical point in the American position at the narrow corridor of Avranches, where the lines of communications went through; on 7 August, in order to profit from this situation, the Germans started an attack aimed at closing this corridor. For this purpose the Germans concentrated four Panzer divisions in the Mortain area, with infantry and bomber support, while the Seventh German Army was to attack at Vire, in order to protect the flank of the armored attack.

At the same time a mounted guard had to be kept along the line Lisieux-Falaise-Argentan-Alençon-Le Mans, covering the roads that led from Brittany and Normandy into the capital. This also created a dangerous salient from the mentioned line towards Vire and Mortain with the risk of it being overrun by the Allies from Caen through Lisieux or from Rennes through Le Mans or Angers.

Once more Allied air superiority brought success, and the counterattack failed after several days of hard and confused fighting.

The German left flank could be considered as totally overthrown at this time, but German tenacity persisted until 12 August, even though a very difficult situation had developed. The Allied maneuver had been unopposed, and that brought the Third Army to Mayenne on 6 August. The Americans also seized the Vilaine line and occupied Nantes on the 10th.

Leaving the VIII Corps of the Third Army in charge of capturing the ports in Brittany, the rest of the troops were employed in the battle of annihilation better known as the "battle of the Falaise-Argentan pocket." The maneuver leading to this battle saw the XV Corps of the Third Army advancing from Mayennes, occupying Le Mans 9 August, meanwhile protected on the outer flank by the XX Corps which arrived on the 10th at Angers and in turn supported by the XII Corps. In this manner, on the 12th, the 5th Armored Division reached the suburbs of Argentan and the 2d French Armored Division reached Ecouche. One of the branches of the pincers was in place, but the other, in spite of strong air support, kept hitting against incredibly strong resistance and therefore the Canadians did not reach Falaise until the 17th. The British occupied Condé and Flers.

The Allies started trying to close the pocket on the 12th, while the Germans, through the use of Panzer divisions, kept holding the opening in order to remove their units, especially their armor. The Germans succeeded between the 12th and the 17th, but when the American XII and XX Corps continued their progress in their flanking movement, a difficult situation was created for the troops holding the opening. Nevertheless, the Germans were able to save the greater part of the armor of eight Panzer divisions. On the 20th, the pocket was closed and the mopping up completed by the 22d. The path across France was now opened to the Anglo-Saxons.

The Third Army, now having unlimited ground available for maneuver, left the VIII Corps in Brittany and proceeded with the three remaining Corps, each one spearheaded by an armored division and supported by a fighter-bomber group. The system achieved excellent results due to the efficient liaison and cooperation between the ground and air forces. The protection of the right flank of this huge force was carried out through the observation and vigilance of the air force. This proved once more that modern war represents the

integration of armor, infantry and artillery in mass, with the necessary air support.

The advance of the Third Army was rapid. The XX Corps arrived at Chartres on the 17th, the same day as the decline of the battle of the Falaise pocket; the XII Corps reached Orleans on the 18th and the XV Corps was at Nantes on the 19th. With the arrival of the XX Corps at Fontainebleau on the 20th, the same day the pocket was sealed, the remnants of the German Seventh Army and the remaining Panzer divisions were left pressed in between the Seine, the sea and the Allied forces in an area where it was very difficult for them to work out an efficient counterattack against their enemies. They had no other possibility of escape except by use of routes established across the lower Seine, using ferries and pontons. Under these conditions the Germans had to retire, strongly pressed by the Allies and harassed by very active Allied aviation.

On the 25th, the Allies had crossed the Seine at several bridgeheads, an objective achieved two weeks ahead of time.

The main difficulty that the Americans found in their advance was to bring up supplies at the same rapid pace. The ports were destroyed or in the hands of the Germans; the railroads paralyzed by destruction; and available trucks were insufficient. The rail lines had to be repaired and railroad matériel had to be transported to the continent; vehicular traffic was intensified through the institution of one-way routes from the beaches to the combat zone and back. Air transports of the First Airborne Army were put into service at this time and delivered 1,000 tons, and later 2,000 tons, per day of equipment needed by the Third Army.

From the start of the battle in France, the Germans had lost 400,000 men (half of them prisoners), 1,300 tanks and 1,500 artillery pieces.

Final Phase

The strategic problem before the Allies now was in deciding the principal and the secondary directions of advance. It was agreed that the principal route of advance would be northeast through Belgium and Holland. Most of the enemy troops were there, as well as the V-2 launching sites, a large number of air fields in Belgium, and the port of Antwerp.

A secondary advance was on the Verdun-Metz axis, which also had the objective of contacting the troops landed in Southern France.

These movements were all very rapid. The Canadians started theirs on 30 August from the bridgeheads between Elbeuf and the sea. They crossed the Somme without opposition on 4 September, and after occupying Ostende they headed towards the Escalde estuary.

The British left from the bridgehead at Vernon, reached Antwerp on the 4th, crossed the Albert Canal on the 7th, and on the 12th crossed the Dutch frontier, arriving a short distance from the Meuse through Eindhoven.

The American First Army crossed the Seine between Nantes and Melun on 29 August, arriving at Maestrich, Holland, on 11 September. It occupied Eupen and Malmedy on German soil and went across Luxemburg.

The Third Army, leaving from Troyes on the 28th, crossed the Marne through Vitry-le-Francois, reaching the line Metz-Nancy-Epinal by the middle of September. Contact with General Devers' forces from Southern France was established at Sombernon on the 11th.

Upon reaching these positions, the front facing east stabilized suddenly into a line south from the area of Aachen all along the German frontier.

The reasons for this stabilization are apparent. On one side is seen the intensi-

fication of the German defenses whose troops were now fighting on the frontiers of their own homeland with larger concentrations of forces and under the shelter of the Siegfried line fortifications; on the other hand the Allies were faced with a serious supply problem with their lines of communications stretched.

The movements and actions beyond this line constituted the battle of Germany.

Defense in Atomic Warfare

Digested by the MILITARY REVIEW from an article by Major E. W. Sheppard, in "The Fighting Forces" (Great Britain) June 1948.

IN Hiroshima, when the first atomic bomb in history was dropped, out of every five inhabitants of the central area, two were killed outright, two more seriously hurt, and only one escaped altogether or with only minor injuries, and the total casualties out of some 185,000 people numbered 140,000. The total casualties in Nagasaki from the dropping of the second bomb were 40,000 killed and 40,000 injured. The American book on which this article is based ("The Problem of Reducing Vulnerability to Atomic Bombs," by A. J. Coale) seeks to answer the vital questions whether, and if so how, these appalling casualty figures may be reduced, and the military problems caused by atomic methods solved, should the world be once more plunged into war. The answers it gives are hardly encouraging.

Anti-atomic defense preparations in time of peace will vary somewhat according to whether or not an international agreement can be concluded prohibiting the production of atomic energy for military use. Unfortunately, it seems unlikely now that any such agreement will be arrived at, mainly because of the obstructive attitude of Soviet Russia; but, in any case, as the author points out, the outbreak of a new world war would almost certainly lead sooner or later to the use of atomic weapons despite any prewar agreement to the contrary. No country could neglect to take account of this probability in its preparations for national defense; the only difference between a future war with a prior anti-atomic agreement and a war without one would therefore be that the initial phase of the war would be fought out without atomic weapons, but that these would be developed during that phase and utilized later. Atomic war therefore will be an inevitable characteristic, according to this book, of any future world war, sooner or later, and such defense against it as is possible is therefore an essential element of national security.

The three aims to be achieved by anti-atomic defense are to prevent an attack by atomic weapons; to win a war involving atomic weapons should one occur; and to minimize the loss of civilian life from atomic attack. In the absence of any anti-atomic international agreement, or even with one, the only sure way of achieving the first aim is to avoid war, and no better means of doing so appears to offer itself than full preparation on a nation's own part to deliver an intense and sustained atomic attack, so as to deter any potential aggressors by "trying to convince them that there was small probability of their gaining the political objects of victory even after the exchange of attacks in an atomic holocaust." From this point of view "the most important object in preparing to win an atomic war would be to avoid having to fight one," for "the goal of winning a war in which quantities of atomic bombs were employed by each side is not one to inspire much enthusiasm."

As regards military preparations for

winning such a war, however, the most important would be (1) provision of an atomic assault force of maximum strength, constantly and effectively secured against even the most sudden and heaviest hostile attack; (2) maintenance of strong defensive forces with maximum capacity for intercepting airborne weapons; (3) research for and development of new atomic explosives, weapons and means of defense; (4) maintenance in protected readiness of all necessary means for carrying on the war after the initial atomic attacks; (5) full intelligence as to the atomic warfare preparations of potential enemies and allies. It would be necessary also, in order to preserve national unity of action and cohesion under attack, (a) to insure continuity and efficiency of Government by distributing its personnel and organs widely and by earmarking substitute personnel and machinery in the event of damage or destruction of those already functioning, and (b) to insure the full working of communications by protection of existing means and provision of alternative means to replace them if put out of action. As regards the armed forces, the national air forces should be safeguarded against destruction as far as possible by a wide dispersal of air fields, launching sites for self-propelled weapons, machines, personnel, and other essentials; these measures can be supplemented by the construction of underground hangers and fuel reservoirs. As regards the army's defensive measures, large concentrations of troops during training or transport must be avoided, and arsenals and supply depots must be dispersed and protected. The navy must learn to dispense with large navy yards, revise its maintenance and repair system, and reconsider its role and tactics in the light of the new conditions of atomic warfare. War production must be safeguarded by suitable location of plants; lavish provision in peacetime of ample reserves of essential raw materials and equipment, sufficient if possible to allow production to continue throughout any future war, without addition during the course of hostilities; and physical protection of personnel and machinery.

Possible means of minimizing civilian casualties, the third aim of peacetime preparations, would include, first, the provision of effective shelters and an efficient warning system; tunnel shelters in Nagasaki proved unexpectedly effective, giving protection against blast, burning and radio-active damage, even though located close to the bomb's point of burst. Second, the density of large urban population should be reduced by wider peacetime distribution of industry and by emergency evacuation on the threat of war or immediately on its outbreak. Government housing subsidies should be given only to schemes of building which facilitate such dispersion, and this consideration should also govern all slum-clearance schemes. The construction of buildings proof, as far as possible, against atomic-bomb blast should be financially encouraged by the government and local authorities. Civil-defense measures should include the location in dispersed and protected areas of hospitals, fire services and equipment, air raid wardens, and mobile relief units. Temporary shelter areas and camps for refugees should be surveyed and provided with skeleton facilities.

All this can and should be done, and should to some extent minimize the devastating effects of atomic attack. But to what extent? That is the crucial question, and the answer must be largely guesswork. Atomic bombs have so far been delivered solely by aircraft, and absolute security can be assured only by detecting and intercepting before it can reach its target, every machine which is, or might be, carrying such bombs. This is not yet an attainable ideal, nor does its attainment seem within sight; until it is, we must

realize that even the very high losses which formerly would have led to the cessation of an air offensive may not be considered prohibitive in view of the devastating results to be achieved by the dropping of even a single atomic bomb, and that suicide planes, notoriously difficult to stop, may well be used for this purpose. Against pilotless planes, the easiest target of all for antiaircraft defenses, the prospects of something more nearly approaching 100 per cent protection seem reasonably hopeful; but against rockets there is at present no proved effective defenses at all. There is also to be considered the uncomfortable possibility of atomic bombs being smuggled in by foreign agents or deposited in harbors by foreign ships; it is unlikely that a large number could be so brought in, but even a few would do great, perhaps irreparable, damage.

As regards actual protection against the effect of bombs, even supposing (which is far from certain, in view of the known fact that far more formidable bombs than those actually used hitherto have already been or can be produced) that some degree of this can be achieved, how much would be required and how long would it take to provide? Government organs, wartime industry and basic services and supplies have all, because they are essential for survival and victory, prior claims to protection over the civilian population. But how long will public morale and the will to victory, which are also prime factors of success, stand up to atomic air attack and to the mass casualties resulting from it if adequate protection cannot be or is not given? How are the people to be kept at work and prevented from rushing to shelter every time an aircraft, however harmless, appears or is heard overhead? These questions are not and perhaps cannot be answered; but they should be the subjects of urgent inquiry by our own government and by every other government in the world.

If the atomic bomb had been used by our adversaries in the last war, only at most one in four who lived and worked in or near any big British city would now be alive to read this article; and the war would certainly have been lost, and lost quickly. There is little or nothing in Professor Coale's book to lead us to hope that our chances of personal survival, or of a victory worth calling by that name, are likely to be much better in any future atomic war than they would have been then.

Discipline and Leadership

Digested by the MILITARY REVIEW from an article by Lieutenant Colonel G. O. N. Thompson in "The Royal Engineers Journal" (Great Britain) September 1947.

THE object of this talk for officers and noncommissioned officers is to bring to your notice some essential things about discipline and leadership which are not yet fully understood.

The time has come to take stock of our position as officers and noncommissioned officers. We are all on the same side in these matters, so we must have a common doctrine or there is danger that some of us may pull in one direction, but others in the contrary direction.

Discipline is not a fixed or rigid science. It is an art, and should constantly be evolving, developing and modifying itself to meet new and varying conditions. I can only give you the principles that seem to me to be unchanged and unchangeable, and allow you to work out detailed applications for yourselves.

Theory of an Ideal Code of Discipline

1. *Methods to be rejected:* I want to say at once—"Reject the bludgeon!" It is clumsy and ineffective because it is rigid and out of date. It depends on fear. Reject also the "Iron hand in the velvet glove." This is only another form of bludgeon. Reject any form of threatening and anything that depends for its effect solely on fear. Reject also any form of *Blitz.*

2. *Objects of discipline:* If we are to design an ideal code of discipline, we should be clear what are the objects that we wish to attain. I think that they might be defined something like this. *In Peace,* so to order affairs in the army that everything runs smoothly, that all ranks are busy, happy and contented, so that everything conduces to make easy our main task, which is to train men, to fit them for their role in war. If in the way we order affairs we also turn soldiers into better citizens that too will be another great gain. *In War,* to insure that the orders given by carefully chosen Commanders will be loyally, unhesitatingly and faithfully carried out in pursuance of the national aims.

3. *Need for elasticity of thought and method:* The methods that succeed with one man may fail with another; this system must be infinitely elastic to cope with all varieties of men and with all kinds of circumstances; it must also be based on a knowledge and understanding of our fellow men, their natures, their strong points and their human failings. Elasticity and thorough understanding of our fellow men must therefore be the basis of any really efficient code of discipline.

Practice of Discipline

Nature of responsibility.—The responsibility of a lance corporal is the same in nature as that of a lieutenant colonel. It only differs in degree. In many ways it is much harder to be a good lance corporal than a good lieutenant colonel, because as the latter you start with the advantage of rank and seniority. As a lieutenant colonel you automatically get respect, unless you fail in some way that is noticed by your men and thus lose their respect. As a lance corporal you have to start by creating that respect, showing that you are worthy of it, otherwise you are bound to fail. Now I cannot say that I know *all* the qualities that men look for, admire and respect in their noncommissioned officers, warrant officers and officers, but I will tell you some that beyond all question are necessary.

1. *Efficiency:* How can a man have confidence in you, or your decisions and orders unless he considers you are efficient? You may fool some of the men, some of the time regarding your efficiency, but you cannot fool all of them all the time. Therefore, the only safe bet is to be efficient. Beware therefore, of biting off more than you can chew. Get yourself efficient in any subject before you start trying to put it across to others. Aim to be a real expert on the subjects you have to put across. Don't think the little things don't matter, or are not worth while.

2. *Fairness:* This is a cardinal point. Avoid any word or action that can possibly be constructed as unfairness or as showing favor or prejudice. It is impossible to help liking some men more than others, that is human nature, and we all have that difficulty, but we must never *show* a preference or a dislike. The best hint I can give you here is to maintain an absolutely impersonal manner in your dealings with juniors in official matters, and avoid any kind of familiarity with them on duty. You must cultivate not only the *manner* of impersonality, but the impersonal way of *thought* when it comes to reporting on men. Force yourself to see the good as well as the bad in those whom you do not like, and the weaknesses, as well as the strong points in those of your juniors whom you do like.

3. *Human understanding—Elasticity of*

mind: Some are born with this quality. Others are not so lucky but all can hope to attain sufficient human understanding to deal with a wide range of human characters. There are two dangers here. You must not let too great a quality of human understanding of others' difficulties lead you into the mistake of becoming soft. If you are soft you are a menace to yourself because some day you will get let down by your men. You are also a menace to the whole system of discipline because if you are soft you forfeit a great deal of respect. So, while you must use all your understanding and sympathy in discovering a man's difficulties and in helping him to overcome them, you must never accept any other yardstick than perfection in measuring the achievement of your men. A leader of any rank will never get any higher standard of service from his men than the standard he exacts, so you must never be satisfied with less than the best. You can and should, however, give praise where praise is due, even if the standard is not quite perfect.

4. *Self-discipline—the force of example:* Remember always that when you are placed in a position of responsibility you become an example to them of what they should aim to be. If therefore, you do not subject yourself to discipline, your men will not achieve any measure of self-discipline themselves. This quality is a very important one because it is a high contributory factor to the degree of respect in which your men will hold you. Here again, if you wish to extract the best from your men, you can only succeed if you never accept anything less than the best of your own performance.

5. *Loyalty:* Here is a quality equally important whether it works up or down. It is as important to be loyal to your subordinates when dealing with superiors, as it is to support an unpopular decision of a superior to your subordinates. Here I have another word of warning, however. Beware of mistaken loyalty. Never support to your superiors what you *know* to have been wrong. Bring forward reasons for the error and arguments for lenient treatment, but never try to protect an inferior who is really to blame. Always accept responsibility for error if it is fairly yours, rather than let it fall on a junior, but don't hide ever behind a senior yourself. If you get orders you don't agree with or think unwise, say so respectfully when you receive them and try to get them changed. Once you have accepted them, then whatever your secret feelings may be, you must see them through, loyally to the bitter end, and never by word or deed let others see that you do not wholly agree with them.

6. *Ruthlessness:* This is my own idea, and you will find no mention of it in any modern treatise on discipline. It is in fact generally accepted as being a rather unpleasant and Prussian quality, and so it can be if wrongly directed or unpleasantly exercised. Nevertheless I have made some study of all the more famous leaders under whom I have served, and I have observed in each one of them this quality of ruthlessness. It means that once a right decision has been made or an order given, then that decision or order must be pursued relentlessly to its uttermost conclusion. There must be no weakening or turning back, no reconsideration or modification once a right decision or wise order has been given. No obstacle must be allowed to stand in the way. Obstructions, human or material, must be swept aside and discarded if necessary. This is the only quality among those I have described that contains the element of fear.

We all know that a great leader under any code of discipline must be able to lead. But I maintain that human nature being often a weak and fallible thing, a leader must also be able to drive those who are not willing to follow him. It

is useless that a leader enter battle unless he brings with him his whole army to support him. So while he leads the willing ones he must also be able to drive the unwilling ones and to do this he requires the quality of ruthlessness.

The great leaders can exercise this quality without bitterness and rancor. Thus, although the object of their ruthlessness has to go, he knows he has had a fair deal, and so do all the others in the unit. This ruthlessness can therefore only be exercised in conjunction with fairness or it is dangerous. If it is also tempered with human understanding, then even the victim holds his leader in continued respect.

7. *Punishment:* Punishment is the last resort in any ideal code of discipline and should never be used until other methods have failed. No punishment should ever be awarded in any vindictive spirit or manner. The object of punishment is the same as the object of all other aids to discipline—it is correction of faults that have occurred and avoidance of repetition of the same faults in future. As a leader you are getting near the end of your tether when you have to start punishing men to get results.

I must emphasize at once that only commissioned officers are charged with the responsibility of awarding punishments when they have to be awarded. In no circumstances can anyone not holding a commission award punishment in the British Army. There are many good reasons for this, perhaps the most important one being that it is a principle of law that a man is innocent till he is proved guilty. The non-commissioned rank is usually the witness who can prove guilt. How then can he also function as a judge fairly? Witnesses are not judges in any of our civil courts.

All ranks charged with administering discipline must, however, understand about punishment, must know what punishments are permitted under Military Law, and also know the powers of punishment of various authorities. Briefly my views on punishment are as follows:

(a) Never punish at all if you can deal with an offense in some other way, e.g., reasoning with an offender and pointing out his offense.

(b) Never award a more severe punishment than you need. Once a commanding officer has given a man twenty-eight days detention, he can only in exceptional circumstances avoid sending that man for Court-Martial for his next offense.

(c) Don't turn men into military criminals by putting a lot of minor punishments on their conduct sheets. Extra duty need not always be so entered.

(d) Make the punishment fit the crime.

(e) Never send a man in front of the commanding officer unless as company commander you have done your bit with him and failed.

(f) Never be prejudiced by a man's apparent bad record in a previous unit. He may have been unlucky. On the other hand, after you have found him to be guilty, look at his conduct sheet, and if he has committed the same offense before in his present unit, then beware of letting him off lightly the second time.

The Strategic Importance of British East Africa

Digested by the MILITARY REVIEW from an article by Major P. Q. Logan in "The Army Quarterly" (Great Britain) April 1948.

THE rather vague geographical term "British East Africa" should be taken to include the northern territories of British Somaliland, Kenya and Uganda, the central area of Tanganyika and the southern territories of Nyassaland and the Rhodesias. South Africa, although a close neighbor of the Rhodesias, must be considered as a separate entity, both politically and economically.

Suez Canal

We are concerned here with the strategic importance of BEA, and to examine its implications we must first look northwards towards Egypt and the Suez Canal. The area immediately west of the Canal, known as the Canal Zone, in which all British Troops in Egypt are now stationed, is long, narrow and mostly desert. Troops garrisoned there are obviously well placed to defend the canal against sabotage or land attack and are a very convenient strategic reserve for our extremely important oil interests in the Middle East. It is doubtful if this oil could easily be protected from any BEA base. During the last war the Canal was used only to a very limited extent owing to the danger to shipping from air attack and because, until the enemy was cleared from North Africa and Southern Italy, our ships could not safely traverse the Mediterranean.

Should Great Britain maintain a base in North Africa or the Middle East, and our diplomacy keep neutral or friendly those countries which flank the northern side of the Mediterranean? Our ships, especially oil ships, can use this sea. How essential it is for us and the United States to be able to carry oil to the west from the wells in Persia, Iraq and Arabia can be realized by the fact that a great deal of our industry is being converted to oil fuel in place of coal, and that the Navy, Army and Air Force would be immobilized without oil. America is also deeply concerned because her own supplies in the United States are becoming exhausted.

The importance to Great Britain of the Suez Canal has diminished with the handover of power in India, and our evacuation of Egyptian territory by 1956 (on the expiration of the Treaty), or earlier, will make it impossible for us to defend it.

There will, too, be no Indian Army, except for a few Ghurka Regiments, to help us protect our Middle and Far East interests while political pressure may well lessen the import of manufactured goods to India from Europe. It also seems likely that the Persian crude oil refined at Abadan in the Persian Gulf will be piped through to refineries in Palestine. However, the Canal offers a much shorter sea route to Europe from East Africa (Mombasa), and although events in India and Burma have probably lessened those countries' importance to us, our trade interests there are still very considerable.

The question of the defense of the Canal Zone is a difficult one. The Balkan States and South Russia are within bombing distance, and it is fairly certain that atomic bombs could very quickly destroy the whole Canal system however many troops were stationed in the area. Therefore it seems that whereas a base in the Middle East or North Africa is most necessary for control of the Mediterranean, it will not be possible to defend the Suez Canal from air attack from any base there. Apart from keeping the Mediterranean open for our shipping, it is necessary to be able to protect the most important items which those ships carry, namely oil. But if we move from our old main strategic base in Egypt to East Africa, can we from there

deny the oil fields of Iraq, Persia and Arabia (Bahrein being the most promising present oil supply in Arabia both to us and to the United States) to any potential enemy?

British East Africa

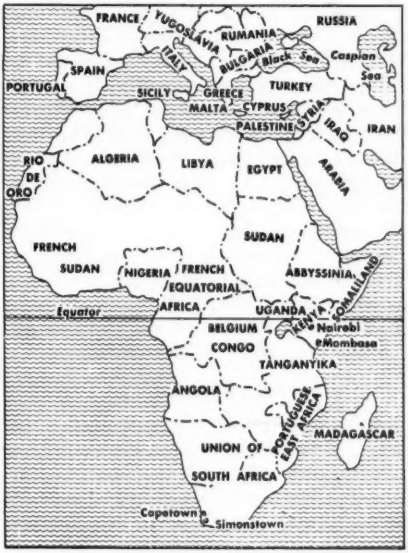
A glance at the sketch map shows that Nairobi, capital of Kenya and possible capital of a Federated British East Africa, lies 2,000 miles by air south of the Canal Zone. By sea from Suez to Mombasa the distance is about 2,500 miles. These two routes, air and sea, are at present the only feasible ways to East Africa from the north.

The great distances from Kenya to the oil areas of Persia and Iraq do not make it a suitable Middle East base. Transport, communications and supply difficulties would be very great even if the Suez Canal was open and we had military transit rights in Palestine. Otherwise any force sent to this area would have to be supplied through Basra.

Again, owing to distance and the strong possibility of the Canal being unusable through sabotage or air attack, East Africa is not strategically well situated for the protection of our Mediterranean shipping, especially when it is realized that there is yet no adequate overland route from Nairobi to Cairo. Malta and Gibraltar alone cannot control the Mediterranean and it is essential for both the Navy and RAF to have a base on the North African coast where a small but mobile Army striking force could also be maintained. East Africa cannot therefore play a dominant part in Middle East strategy, but she has another very important role.

Both in the Middle and Far East the rising tide of nationalism and our new poverty have led to the decrease in British influence. In East Africa, however, there is as yet little evidence of political consciousness amongst Africans and extremely little anti-British feeling except where deliberately fostered by outside influences. Considering that Africa is almost entirely divided up into European zones of influence, the largest area being British, it is most important that cooperation and goodwill should exist between Africans and Europeans of every nationality.

As regards trading possibilities, if a demand for manufactured goods can be aroused amongst the millions of native inhabitants and their standard of living raised, there is in Africa a huge potential market for British industry. As many



people see it, the African Colonial Empire is likely to be the successor of the old Indian Empire.

Therefore any defense system must be applicable to all British Africa, with the exception of West Africa, which is outside the scope of this article. When considering the vulnerability of this area of British Africa, one sees that attack by land can come only from the north and then through desert or barren waste of

appalling extent. Even then the enemy would have to gain control of the Eastern Mediterranean and of Egypt to have even the base of his main supply-line safe. Invasion from Arabia across the Red Sea would be even more unlikely. It is reasonable, therefore, to assume that the future invader will have to come by sea.

An attack from the east or northeast appears to be the most likely direction. An essential preliminary to such an invasion must be the gaining of control of Madagascar. This huge island, under French rule, has an important naval base at Diego Suarez on its northern end. Nor can any enemy be allowed to seize Beira or Laurenco Marques. Arrangements for their defense must be made with the Portuguese. Madagascar must be the advance base, with a powerful naval striking force and land-based heavy bombers. A really strong force based here should neutralize the probable enemy occupation of the Seychelles and Mauritius, which are too far off for us to hold in strength and are thus not worth holding at all. As a secondary naval base Mombasa would have importance in control of the Red Sea and the northern sector.

British Southeast Africa

The Dominion of South Africa is the heart of Southeast Africa. Here are the large modern ports of Capetown and Durban and the naval base at Simonstown; here also is where the heavy industry necessary to maintain the fighting forces can be developed.

As regards air fields there are already excellent ones in South Africa, Southern Rhodesia and Kenya.

Finally let us consider the role of the Army. The rise of nationalist feeling in Asia, so evident in India and China, has not yet spread to Africa. However, labor troubles and anti-British agitation, allied to a very slowly awakening nationalist spirit, will produce a need for internal security forces. There is also a permanent threat from the north of tribal raids from Abyssinia and Somalia. These internal security problems could be handled by the locally recruited King's African Rifles assisted by a hard core of one British Brigade Group. Farther south the Rhodesians and South Africans would maintain their own forces in peacetime, but Britain would have to provide large reinforcements on a threat of war. If the Canal were closed these would come via the Cape or overland from West Africa, where African soldiers of proved value could also be obtained in large numbers. At present there is no practicable road or rail route from West Africa, but it is quite possible to construct one. Heavy stores, however, would still have to come by sea to Capetown or Durban.

In an invasion the Army would be responsible for the protection of air fields and naval bases and be prepared to destroy immediately any enemy bridgehead made in South East Africa or Madagascar.

To conclude, one can foresee the probability of Africa taking the place of India in the British Empire, with its attendant responsibilities of defense necessitating close liaison with France and Portugal. It appears certain, however, that British East Africa cannot take the place of any present Middle East base nor affect the strategic position in the Mediterranean.

In modern war, armed forces that cannot move swiftly to attack or to meet attacks have little hopes of success.

Air Vice-Marshal Sir Thomas Elmhirst, Great Britain